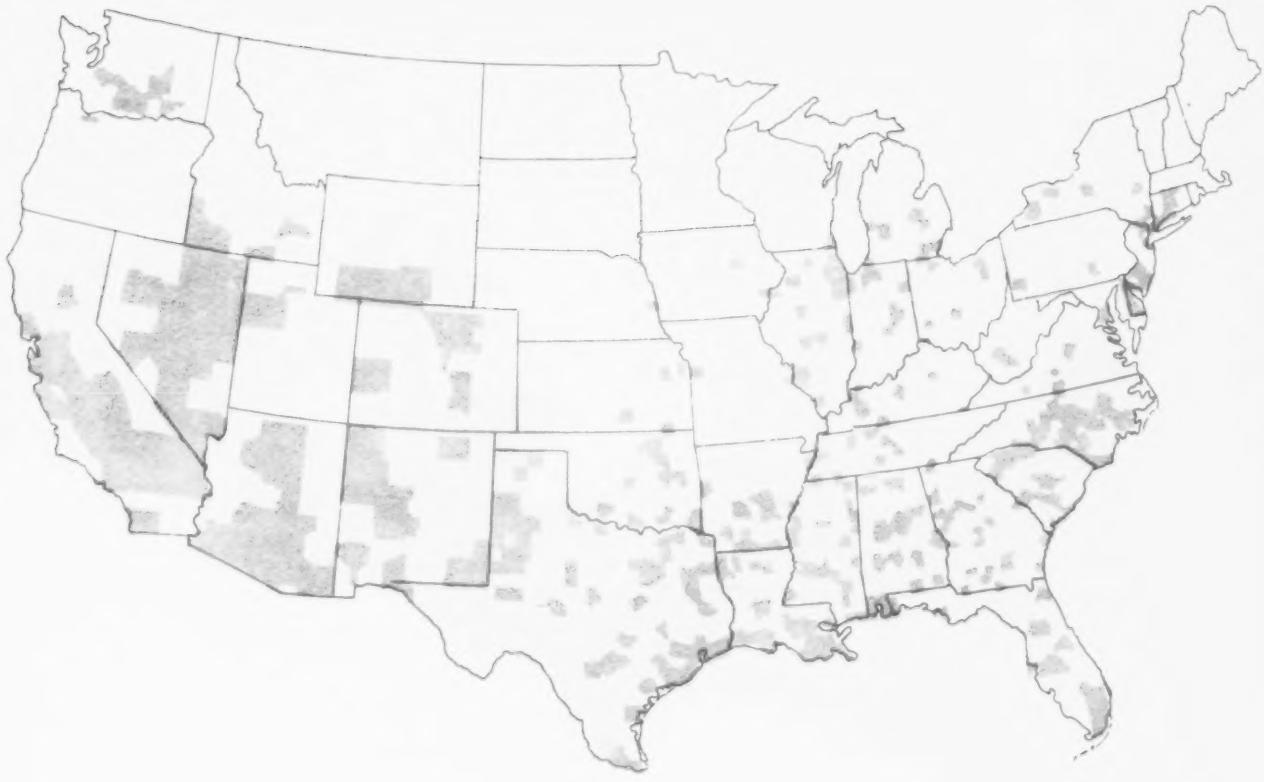
TOXIC WASTES AND RACE
In The United States

A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites



COMMISSION FOR RACIAL JUSTICE
United Church of Christ
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TOXIC WASTES AND RACE IN THE UNITED STATES:

A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites

Commission for Racial Justice
United Church of Christ

Dr. Benjamin F. Chavis Jr.
Executive Director

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Toxic Injustice

Public Data Access, Inc.

1987

COVER DESIGN KEY:

Shaded areas represent counties where the Black and/or Hispanic percentage of the population is greater than their respective national percentages.

(Black percentage of the population in U.S.: 12 percent)

(Hispanic percentage of the population in U.S.: 6 percent)

Dark areas represent counties where the Black and/or Hispanic percentage of the population is greater than their respective national percentages and where five or more uncontrolled toxic waste sites are located.

Source: U.S. Bureau of the Census
U.S. Environmental Protection Agency

Copies of map on cover are available upon request. Additional copies of this report are available for $15.00, plus $2.50 for postage and handling.

All inquiries regarding this report should be directed to:

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COMMISSION FOR RACIAL JUSTICE
UNITED CHURCH OF CHRIST

The Commission for Racial Justice is the racial justice agency of the United Church of Christ. The Commission provides leadership in mobilizing the membership of the Church to work for justice and reconciliation, in the area of race, both within the Church and in society in general. Throughout its 24-year history, the Commission has been actively involved in the human rights struggles of African American and other racial and ethnic communities in the United States. The Commission maintains a national office in New York City and regional offices in Washington, D.C.; Raleigh, North Carolina; and Chicago, Illinois.

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Charles Lee
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PREFACE

The Commission for Racial Justice of the 1.7 million-member United Church of Christ is pleased to release this report, Toxic Wastes and Race in the United States: A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites. We believe that this report is of utmost importance, not only to racial and ethnic communities, but also to the nation as a whole. It is the first national report to comprehensively document the presence of hazardous wastes in racial and ethnic communities throughout the United States.

Since 1982, we have investigated and challenged the alarming presence of toxic substances in residential areas across the country. These investigations led us to examine the relationship between the treatment, storage and disposal of hazardous wastes and the issue of race.

In January 1986, two cross-sectional studies were initiated, utilizing appropriate statistical techniques, to determine the extent to which African Americans, Hispanic Americans, Asian Americans, Pacific Islanders, Native Americans and others are exposed to hazardous wastes in their communities. These were the first national studies to examine this subject. One study focused on commercial hazardous waste facilities; the other focused on uncontrolled toxic waste sites. The data presented in this report are the result of both studies.

Much of the data exhibited in this report has never before been compiled for public review. It is our hope that this information will be used by all persons committed to racial and environmental justice to challenge what we believe to be an insidious form of racism. We share a common definition of racism with the National Council of Churches Racial Justice Working Group:

> Racism is racial prejudice plus power. Racism is the intentional or unintentional use of power to isolate, separate and exploit others. This use of power is based on a belief in superior racial origin, identity or supposed racial characteristics. Racism confers certain privileges on and defends the dominant group, which in turn sustains

> and perpetuates racism. Both consciously and unconsciously, racism is enforced and maintained by the legal, cultural, religious, educational, economic, political, environmental and military institutions of societies. Racism is more than just a personal attitude; it is the institutionalized form of that attitude.

This report is intended to better enable the victims of this insidious form of racism not only to become more aware of the problem, but also to participate in the formulation of viable strategies. Too often African Americans and other racial and ethnic peoples are the victims of racism but are relegated to a defensive or reactive response, rather than a proactive position.

We are releasing this report in the interests of the millions of people who live in potentially health-threatening situations. In particular, we call attention to the fact that race is a major factor related to the presence of hazardous wastes in residential communities throughout the United States.

The United Church of Christ, through the Commission for Racial Justice, has made a long-term commitment to seeing that justice is done across the lines of race. As a national church-based civil rights agency, we believe that the time has come for all church and civil rights organizations to take this issue seriously.

We realize that involvement in this type of research is a departure from our traditional protest methodology. However, if we are to advance our struggle in the future, it will depend largely on the availability of timely and reliable information. We believe this data should be utilized by federal, state and municipal governments to prevent hazardous wastes from becoming an even greater national problem. No residential community, regardless of race, should be left defenseless in the midst of this mounting crisis.

We are grateful to the Special Appeals Committee of the Executive Council of the United Church of Christ for providing funding from the Neighbors In Need Offering for the studies and for this report. Special recognition should be given to Charles Lee, Director, Special Project On Toxic Injustice of the Commission for Racial Justice, who was responsible for coordinating the publication of Toxic Wastes and Race in the United States.

Benjamin F. Chavis Jr.
Executive Director

EXECUTIVE SUMMARY

Recently, there has been unprecedented national concern over the problem of hazardous wastes. This concern has been focused upon the adverse environmental and health effects of toxic chemicals and other hazardous substances emanating from operating hazardous waste treatment, storage and disposal facilities as well as thousands of abandoned waste sites. Efforts to address this issue, however, have largely ignored the specific concerns of African Americans, Hispanic Americans, Asian Americans, Pacific Islanders and Native Americans. Unfortunately, racial and ethnic Americans are far more likely to be unknowing victims of exposure to such substances.

Public policies ushered in by the Reagan Administration signaled a reduction of domestic programs to monitor the environment and protect public health. Reduction of efforts to protect public health is especially disturbing in light of the many citizens who unknowingly may be exposed to substances emanating from hazardous waste sites. According to a December 1986 U.S. General Accounting Office (GAO) report, the U.S. Environmental Protection Agency (EPA) "does not know if it has identified 90 percent of the potentially hazardous wastes or only 10 percent."

Issues surrounding the siting of hazardous waste facilities in racial and ethnic communities gained national prominence in 1982. The Commission for Racial Justice joined ranks with residents of predominantly Black and poor Warren County, North Carolina in opposing the establishment of a polychlorinated biphenyl (PCB) disposal landfill. This opposition culminated in a nonviolent civil disobedience campaign and more than 500 arrests. As a result of the protests in Warren County, the GAO studied the racial and socio-economic status of communities surrounding four landfills in southeastern United States. It found that Blacks comprised the majority of the population in three of the four communities studied.

Previous to the Warren County demonstrations, racial and ethnic communities had been marginally involved with issues of hazardous wastes. One reason for this can be traced to the nature of the environmental movement which has historically been white middle and upper-class in its orientation. This does not mean, however, that racial and ethnic communities do not care

about the quality of their environment and its effect on their lives. Throughout the course of the Commission for Racial Justice's involvement with issues of hazardous wastes and environmental pollution, we have found numerous grassroots racial and ethnic groups actively seeking to deal with this problem in their communities.

Racial and ethnic communities have been and continue to be beset by poverty, unemployment and problems related to poor housing, education and health. These communities cannot afford the luxury of being primarily concerned about the quality of their environment when confronted by a plethora of pressing problems related to their day-to-day survival. Within this context, racial and ethnic communities become particularly vulnerable to those who advocate the siting of a hazardous waste facility as an avenue for employment and economic development. Thus, proposals that economic incentives be offered to mitigate local opposition to the establishment of new hazardous waste facilities raise disturbing social policy questions.

Having observed these developments, the United Church of Christ Commission for Racial Justice decided, in 1986, to conduct extensive research on the relationship between the location of sites containing hazardous wastes and the racial and socio-economic characteristics of persons living in close proximity to those sites. The Commission for Racial Justice employed Public Data Access, Inc., a New York-based research firm, to assist in these investigations. It was hoped that these studies would lead, for the first time, to a comprehensive national analysis of the relationship between hazardous wastes and racial and ethnic communities.

"Hazardous wastes" is the term used by the EPA to define by-products of industrial production which present particularly troublesome health and environmental problems. Newly generated hazardous wastes must be managed in an approved "facility", which is defined by the EPA as any land and structures thereon which are used for treating, storing or disposing of hazardous wastes (TSD facility). Such facilities may include landfills, surface impoundments or incinerators. A "commercial" facility is defined as any facility (public or private) which accepts hazardous wastes from a third party for a fee or other remuneration.

"Uncontrolled toxic waste sites" refer to closed and abandoned sites on the EPA's list of sites which pose a present and potential threat to human health and the environment. The problem of human exposure to uncontrolled hazardous wastes is national in its scope. By 1985, the EPA had inventoried approximately 20,000 uncontrolled sites containing hazardous wastes across the nation. The potential health problems associated with the existence of these sites is highlighted by the fact that approximately 75 percent of U.S. cities derive their water supplies, in total or in part, from groundwater.

MAJOR FINDINGS

This report presents findings from two cross-sectional studies on demographic patterns associated with (1) commercial hazardous waste facilities and (2) uncontrolled toxic waste sites. The first was an analytical study which revealed a striking relationship between the location of commercial hazardous waste facilities and race. The second was a descriptive study which documented the widespread presence of uncontrolled toxic waste sites in racial and ethnic communities throughout the United States. Among the many findings that emerged from these studies, the following are most important:

Demographic Characteristics of Communities with Commercial Hazardous Waste Facilities

-- Race proved to be the most significant among variables tested in association with the location of commercial hazardous waste facilities. This represented a consistent national pattern.

-- Communities with the greatest number of commercial hazardous waste facilities had the highest composition of racial and ethnic residents. In communities with two or more facilities or one of the nation's five largest landfills, the average minority percentage of the population* was more than three times that of communities without facilities (38 percent vs. 12 percent).

-- In communities with one commercial hazardous waste facility, the average minority percentage of the population was twice the average minority percentage of the population in communities without such facilities (24 percent vs. 12 percent).

-- Although socio-economic status appeared to play an important role in the location of commercial hazardous waste facilities, race still proved to be more significant. This remained true after the study controlled for urbanization and regional differences. Incomes and home values were substantially lower when communities with commercial facilities were compared to communities in the surrounding counties without facilities.

* In this report, "minority percentage of the population" was used as a measure of "race".

-- Three out of the five largest commercial hazardous waste landfills in the United States were located in predominantly Black* or Hispanic communities. These three landfills accounted for 40 percent of the total estimated commercial landfill capacity in the nation.

Demographic Characteristics of Communities with Uncontrolled Toxic Waste Sites

-- Three out of every five Black and Hispanic Americans lived in communities with uncontrolled toxic waste sites.

-- More than 15 million Blacks lived in communities with one or more uncontrolled toxic waste sites.

-- More than 8 million Hispanics lived in communities with one or more uncontrolled toxic waste sites.

-- Blacks were heavily over-represented in the populations of metropolitan areas with the largest number of uncontrolled toxic waste sites. These areas include:

Memphis, TN	(173 sites)	Cleveland, OH	(106 sites)
St. Louis, MO	(160 sites)	Chicago, IL	(103 sites)
Houston, TX	(152 sites)	Atlanta, GA	(94 sites)

-- Los Angeles, California had more Hispanics living in communities with uncontrolled toxic waste sites than any other metropolitan area in the United States.

-- Approximately half of all Asian/Pacific Islanders and American Indians lived in communities with uncontrolled toxic waste sites.

-- Overall, the presence of uncontrolled toxic waste sites was highly pervasive. More than half of the total population in the United States resided in communities with uncontrolled toxic waste sites.

* In this report, the terminology used to describe various racial and ethnic populations was based on categories defined by the U.S. Bureau of the Census: Blacks, Hispanics, Asian/Pacific Islanders and American Indians.

MAJOR CONCLUSIONS AND RECOMMENDATIONS

The findings of the analytical study on the location of commercial hazardous waste facilities suggest the existence of clear patterns which show that communities with greater minority percentages of the population are more likely to be the sites of such facilities. The possibility that these patterns resulted by chance is virtually impossible,* strongly suggesting that some underlying factor or factors, which are related to race, played a role in the location of commercial hazardous waste facilities. Therefore, the Commission for Racial Justice concludes that, indeed, race has been a factor in the location of commercial hazardous waste facilities in the United States.

The findings of the descriptive study on the location of uncontrolled toxic waste sites suggest an inordinate concentration of such sites in Black and Hispanic communities, particularly in urban areas. This situation reveals that the issue of race is an important factor in describing the problem of uncontrolled toxic waste sites. We, therefore, conclude that the cleanup of uncontrolled toxic waste sites in Black and Hispanic communities in the United States should be given the highest possible priority.

These findings expose a serious void in present government programs addressing racial and ethnic concerns in this area. This report, therefore, strongly urges the formation of necessary offices and task forces by federal, state and local governments to fill this void. Among the many recommendations of this report, we call special attention to the following:

-- We urge the President of the United States to issue an executive order mandating federal agencies to consider the impact of current policies and regulations on racial and ethnic communities.

-- We urge the formation of an Office of Hazardous Wastes and Racial and Ethnic Affairs by the U.S. Environmental Protection Agency. This office should insure that racial and ethnic concerns regarding hazardous wastes, such as the cleanup of uncontrolled sites, are adequately addressed. In addition, we urge the EPA to establish a National Advisory Council on Racial and Ethnic Concerns.

-- We urge state governments to evaluate and make appropriate revisions in their criteria for the siting of new hazardous waste facilities to adequately take into account the racial and socio-economic characteristics of potential host communities.

* All of the national findings were found to be statistically significant with 99.99 percent confidence (that is, findings with a probability of less than 1 in 10,000 that they occurred by chance).

-- We urge the U.S. Conference of Mayors, the National Conference of Black Mayors and the National League of Cities to convene a national conference to address these issues from a municipal perspective.

-- We urge civil rights and political organizations to gear up voter registration campaigns as a means to further empower racial and ethnic communities to effectively respond to hazardous waste issues and to place hazardous wastes in racial and ethnic communities at the top of state and national legislative agendas.

-- We urge local communities to initiate education and action programs around racial and ethnic concerns regarding hazardous wastes.

We also call for a series of additional actions. Of paramount importance are further epidemiological and demographic research and the provision of information on hazardous wastes to racial and ethnic communities.

This report firmly concludes that hazardous wastes in Black, Hispanic and other racial and ethnic communities should be made a priority issue at all levels of government. This issue is not currently at the forefront of the nation's attention. Therefore, concerned citizens and policy-makers, who are cognizant of this growing national problem, must make this a priority concern.

1. A CONTEXT FOR EXAMINING TOXIC WASTES AND RACE

The federal government has traditionally assumed the major responsibility for protecting the health and well-being of the nation. During the 1980's, however, an alarming trend has emerged. The "New Federalism" ushered in by the Reagan Administration signaled a reduction of domestic programs to monitor the environment and protect public health.

These policies have resulted in a number of negative actions by federal agencies, the most startling being a 1985 U.S. Labor Department ruling that did not require the provision of drinking water and field sanitation facilities for farmworkers. In his decision, Labor Secretary William Brock stated that while there was clear evidence of "unacceptable risks" from lack of such facilities, he felt "action by states would be preferable, and more effective." In striking down this ruling, a three-judge panel in Washington, D.C. labeled it part of a "disgraceful chapter of legal neglect."[1]

With respect to hazardous waste management, the U.S. Environmental Protection Agency (EPA) has been pursuing a policy of delegating more responsibility to state agencies. During the current era of budget reductions, such policies may have serious implications. The Congressional Office of Technology Assessment cautions that this program may present "an unacceptable combination of shifting increasing responsibilities to the States without corresponding increases in necessary resources."[2] In 1984, 25 states reported a 63.5 percent resource shortfall in funds for hazardous waste enforcement.[3] This policy has been characterized as an abdication of, rather than a shifting of, the agency's responsibilities.[4]

Reduction of efforts to protect public health is especially disturbing in light of the many citizens who unknowingly may be exposed to substances emanating from hazardous waste sites. The U.S. General Accounting Office (GAO) reported in December 1986 that potentially large numbers of hazardous wastes remained unidentified. According to the GAO, the EPA division director responsible for hazardous waste identification stated that the "EPA does not know if it has identified 90 percent of the potentially hazardous wastes or only 10 percent."[5]

Unfortunately, Blacks, Hispanics, Asians and Pacific Islanders, and American Indians* in the United States are likely to be most victimized by this emerging trend. It is widely believed that racial and ethnic communities may suffer the most severe environmental pollution problems. For example, air pollution levels in the Washington, D.C. metropolitan area were found to be higher in poorer areas of the city and among the Black population. A similar situation was said to exist in New York, Chicago, Denver, Los Angeles and San Francisco.[6]

According to panelists at the Fourth National Policy Institute, a conference co-sponsored by a wide range of organizations including the Joint Center for Political Studies, the Congressional Black Caucus and the National Conference of Black Mayors, Blacks are disproportionately burdened by environmental problems because they are more likely to hold industrial jobs where chemical processing or manufacturing poses health risks. This problem is exacerbated by the concentration of Blacks in urban areas, often in proximity to hazardous waste dumps or polluting factories.[7]

In recent years, a question arose as to whether or not racial and ethnic communities will be placed in greater jeopardy by the location of new hazardous waste management facilities. A particularly cogent question dealt with the role of race in the location of such facilities. One particular incident focused national attention on this issue.

During 1982, the Commission for Racial Justice, under the direction of its former Executive Director, Dr. Charles E. Cobb, joined ranks with residents of rural Warren County, North Carolina in opposing the establishment of a polychlorinated biphenyl (PCB) disposal landfill. The State of North Carolina's plan to site this hazardous waste facility in a predominantly Black and poor county sparked heated local opposition, which culminated in non-violent civil disobedience protests. These actions resulted in national media attention and more than 500 arrests. Among the demonstrators arrested were Walter E. Fauntroy, Congressman from the District of Columbia; Dr. Joseph Lowery, President of the Southern Christian Leadership Conference; Dr. Benjamin F. Chavis Jr., the current Executive Director of the United Church of Christ Commission for Racial Justice; and the Rev. Leon White, Director of the Commission for Racial Justice's Southern Regional Office in Raleigh, North Carolina.

The protests in Warren County raised the question of how many other racial and ethnic communities were similarly affected by hazardous wastes. This question was partially explored in a study conducted in 1983 by the U.S.

* In this report, the terminology used to describe various racial and ethnic populations was based on categories defined by the U.S. Bureau of the Census: Blacks, Hispanics, Asian/Pacific Islanders and American Indians.

Government Accounting Office. The GAO study, performed at the request of Congressman Fauntroy, examined the racial and socio-economic status of communities surrounding four hazardous waste landfills in the southeastern United States. A key finding was that Blacks comprised the majority of the population in three of the four communities studied.[8]

The GAO study, while important, was limited by its regional scope. It was not designed to examine the relationship between the location of hazardous waste facilities throughout the United States and the racial and socio-economic characteristics of persons residing near them. Nor, prior to our current report, had there been a study to ascertain whether the GAO finding was indicative of any national patterns.

This report attempts to fill that void by presenting, for the first time, a comprehensive national analysis of the relationship between hazardous wastes and racial and ethnic communities. Ultimately, we hope this effort contributes to aiding racial and ethnic communities and organizations, public health professionals and policy-makers to focus urgently needed attention on the problems of hazardous wastes and environmental pollution in racial and ethnic communities.

THE PROBLEM

The U.S. Environmental Protection Agency uses the term "hazardous wastes" to define by-products of industrial production which present particularly troublesome health and environmental problems. Hazardous wastes are defined by the EPA as wastes which are toxic, ignitable, corrosive or dangerously reactive (40 Code of Federal Regulations, Part 261.20). Many common materials may ultimately become hazardous wastes. For example, varnish and detergents, used dry-cleaning solvents and mercury from used batteries have become hazardous wastes.

Until the late 1970's, most hazardous wastes were discarded without consideration of the dangers they posed. Moreover, proper care was lacking when hazardous chemicals were produced, stored and transported. The glaring lack of hazardous waste management regulations created a permissive atmosphere for discarding wastes in the cheapest possible ways. The EPA recognized that, up to this time, 80 to 90 percent of hazardous wastes were disposed of without adequate safeguards for human health and the environment.[9]

The EPA uses the term "uncontrolled hazardous waste sites"* to define a wide range of closed and abandoned sites which pose a present and potential

* For the purposes of this report, we also refer to "uncontrolled hazardous waste sites" as "uncontrolled toxic waste sites".

threat to human health and the environment. They may be indiscriminately placed dumps, abandoned or closed disposal facilities, accidental spills, illegal discharges or closed factories and warehouses where hazardous materials have been produced, used or stored.[10]

In 1984, the EPA reported that "uncontrolled hazardous waste sites may present some of the most serious environmental and public health problems the nation has ever faced."[11] Environmental damage due to contamination by hazardous wastes are among the most difficult and costly to ameliorate. The ultimate financial cost of cleaning up these sites could easily exceed 100 billion dollars.[12] More importantly, according to an editorial in the American Journal of Public Health, "there are already in our environment sufficient quantities of hazardous wastes to provide a legacy of disease and death to our descendants for generations yet to come."[13]

The problem of human exposure to uncontrolled hazardous wastes is national in its scope. By 1985, the EPA had inventoried approximately 20,000 uncontrolled sites containing hazardous wastes across the nation.[14] The potential health problems associated with the existence of these sites is highlighted by the fact that between 40 to 50 percent of Americans depend upon groundwater as their primary source of drinking water. Approximately 75 percent of U.S. cities derive their water supplies, in total or in part, from groundwater.[15]

Few Americans were aware of the problems associated with hazardous wastes a decade ago. Within a remarkably short period of time, this issue climbed to the top of public opinion polls as an area of concern for Americans. Seldom have so many citizens expressed such unanimity of opinion as in their desire to see these problems solved.[16]

LAWS TO ADDRESS THE PROBLEM

To address this growing national problem, Congress has enacted two major laws: the Resource, Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Newly generated hazardous wastes must be managed in an approved facility. A "facility" is defined by the EPA as any land and structures thereon which are used for treating, storing or disposing of hazardous wastes (TSD facility); such facilities include landfills, surface impoundments or incinerators (40 Code of Federal Regulations, Part 260.10). TSD facilities are regulated by the EPA under the authority granted to it by Congress through the Resource, Conservation and Recovery Act (RCRA) enacted in 1976. RCRA established a "cradle-to-grave" approach to regulating the generation, storage, transportation, treatment and disposal of newly generated hazardous wastes. Under RCRA, states and the federal government share

responsibility for management of newly generated hazardous wastes. The EPA has promulgated regulations applicable to generators of hazardous wastes, as well as to transporters of such wastes. Design and operational standards for TSD facilities also have been issued by the EPA. In addition, RCRA requires operators of TSD facilities to obtain permits which contain requirements for operation of such facilities. These requirements are generally site specific.

Among the other provisions of RCRA is a delegation of responsibility to the states for "siting", or approving the location of a new TSD facility, subject to certain federally mandated technical criteria. The public is granted certain rights under RCRA. Under its penalty provisions, citizens may sue any company, or in certain instances the EPA, for violations of applicable regulations. In addition, any person may petition the EPA to promulgate, amend or repeal any regulation issued under the law. The law directs the EPA and the states to provide for, encourage and assist public participation in the "development, revision, implementation and enforcement of any regulation, guideline, information or program" under it. Finally, RCRA permits a state to assume primary responsibility for managing hazardous wastes within its borders upon the EPA's approval of a plan submitted by the state.

By the time RCRA was enacted, the nation's hazardous waste problem was already widespread. The provisions of RCRA did not provide for the cleanup of areas such as Love Canal, New York, where in 1977, chemicals had bubbled into the homes of the town's residents. In 1980, Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as "Superfund".

CERCLA authorizes the federal government to finance the cleanup of hazardous waste sites from a trust fund established with tax monies levied on certain products (petrochemicals, inorganic raw materials, domestic crude oil and imported petroleum products). It also permits the federal government to require parties responsible for causing the release, or creating the uncontrolled hazardous waste site, to finance cleanup. Superfund requires states to participate in any cleanup action within their borders; they either may cooperate with the EPA or they may take the lead on cleanup projects themselves.

Uncontrolled hazardous waste sites are identified by the EPA in the "Comprehensive Environmental Response, Compensation and Liability Act Information System" (CERCLIS). Those sites requiring long-term "remedial action" are listed on the National Priorities List (NPL) which the agency has established. Only those sites listed on the NPL are eligible for federal cleanup funds under Superfund.

The 1986 amendments for Superfund require health assessments to be performed for each facility listed on the NPL. They also require public notification of, and participation in, the plans for remedial actions

initiated under this law. By mid-1987, all states must establish emergency response commissions which then shall appoint local emergency planning committees to implement the new community right-to-know provisions.

The EPA maintains the toll-free "RCRA/Superfund Hotline" (1-800-424-9346) and 10 regional offices around the country where citizens may seek information and assistance on hazardous waste problems. The EPA also maintains an office for a Hazardous Waste Ombudsman, located in Washington, D.C., who responds to grievances and suggestions from, as well as provides information to, citizens. Citizens also may seek assistance from agencies in their states which are responsible for managing hazardous wastes.

KEY ISSUES OF TOXIC WASTES AND RACE

Notwithstanding the existence of legislation and other efforts to address hazardous wastes and the environment, racial and ethnic persons have been marginally involved with these issues. The reasons for this can be traced to the nature of the environmental movement which has historically been white middle and upper-class in its orientation. At the same time, "environmentalism" emerged during the height of the civil rights movement when the attention of most civil rights organizations was focused on other concerns.[17]

Thus, it is all the more critical that the issues of hazardous wastes which confront racial and ethnic peoples be properly prioritized. Today, most Black and other racial and ethnic communities are beset by rising unemployment, increasing poverty, worsening housing and declining educational and health status. It would be very difficult to properly address issues of the environment outside the context of these concerns. In short, racial and ethnic communities cannot afford the luxury of being primarily concerned about the quality of their environment when confronted by a plethora of pressing problems related to their day-to-day survival.

This does not mean, however, that racial and ethnic persons do not care about the quality of their environment and its effect on their lives. Research has suggested that residents of visibly polluted communities, regardless of racial and socio-economic status, are becoming more conscious of this problem.[18] Throughout the course of the Commission for Racial Justice's involvement with issues of hazardous wastes and environmental pollution, we have found numerous grassroots racial and ethnic groups actively seeking to deal with this problem in their communities. Indeed, the League of Conservation Voters credits the Congressional Black Caucus with having one of the best bloc voting records on environmental issues.[19]

The proper delineation of issues with respect to hazardous wastes is vital as racial and ethnic peoples begin to seriously address this problem in

their communities. The first issue we have identified pertains to information. The availability of proper information is critical to determining how communities respond to environmental problems.

As a whole, community activists have found the acquisition of needed information to be a difficult task. A recent survey of 110 community groups found that "nearly nine out of every ten groups (88 percent) perceived obstacles to obtaining information. Almost half (45 percent) claimed that government agencies blocked their learning process."[20] Institutional resistance to providing information is likely to be greater when agencies are confronted by groups, such as those among racial and ethnic communities and the poor, who are perceived to wield less political clout.

Secondly, the hazardous waste issue has become very much linked to the state of the economy in a given community. Many racial and ethnic communities have highly depressed economies and alarming unemployment rates; they would be particularly vulnerable to those who advocate the siting of a hazardous waste facility as an avenue for employment and economic development. In recent years, a school of thought has emerged which raises the viability of compensating communities which agree to host hazardous waste facilities.[21,22] This theory argues that economic incentives can be offered to local residents so that the perceived benefits outweigh the perceived risks.[23] To advance such a theory in the absence of the consideration of the racial and socio-economic characteristics of host communities and existing forms of institutionalized racism leaves room for potential discrimination.

Lastly, consideration of the racial and socio-economic status of a community when dealing with the issue of hazardous wastes is critical from a public health perspective. Many reports, such as the recent Report of the Secretary's Task Force on Black and Minority Health, issued by the U.S. Department of Health and Human Services, have documented the lower health status of "minority" populations as compared to white Americans.[24] This status needs to be considered when priorities are set for the cleanup of hazardous wastes. Furthermore, consideration of existing health status needs to be incorporated into the decision-making process for the location of new hazardous waste and polluting facilities. Lacking this, there is the risk of compounding the serious preexisting health problems in racial and ethnic communities.

In conclusion, these issues are interrelated. The success of a democracy depends upon the full participation of its citizenry. The hazardous waste issue is admittedly a complex one. Decisions related to it require an informed public, particularly in directly impacted communities. Blacks, Hispanics, Asian/Pacific Islanders, American Indians and other racial and ethnic persons need to adopt a more proactive posture with respect to this critical issue; they need to be able to clearly define their own interests within the context of the various social ills confronting them.

2. DESCRIPTION OF STUDIES

RESEARCH METHODOLOGY

Two cross-sectional studies were conducted under the auspices of the Commission for Racial Justice to determine the racial and socio-economic characteristics of Americans living in residential areas surrounding commercial hazardous waste facilities and uncontrolled toxic waste sites throughout the United States. The Commission for Racial Justice employed Public Data Access, Inc., a New York-based research firm, to assist in these investigations.

For the purposes of these studies, information on racial classifications as defined by the U.S. Bureau of the Census was incorporated into a database. This information came from the 1980 U.S. Census (Summary Tape File 3B, or STF 3B). Populations which are classified by the U.S. Census Bureau as Blacks, Hispanics, Asians and Pacific Islanders, American Indians, Eskimos, Aleuts and other "non-White" persons were used to measure "race". These studies used residential 5-digit ZIP code areas to define "communities".

The first study sought to determine whether the variables of race and socio-economic status played a significant role in the location of commercial hazardous waste treatment, storage and disposal facilities. It required (1) the development of databases which contained nationally comprehensive information on commercial hazardous waste facilities and the racial and socio-economic characteristics of U.S. communities, (2) statistical analyses of factors which may be relevant to the location of hazardous waste facilities, and (3) description of the racial and socio-economic characteristics of communities where commercial hazardous waste facilities were located.

The major objective of the study was to determine the relationship between racial characteristics of populations and the location of commercial hazardous waste facilities in the United States. A primary question examined was whether the racial composition of the population was significantly different in communities with commercial hazardous waste facilities. The rationale for paying special attention to operating commercial or "off-site" rather than "on-site" facilities, which are by

definition located at the site of production, was that the location of "off-site" facilities is more likely to be influenced by factors other than proximity to industrial activity, such as land values or the degree of local opposition.

The 415 operating commercial hazardous waste facilities examined in this study include all identified facilities in the contiguous United States as of May 1986. Information on commercial facilities were extracted from the EPA's Hazardous Waste Data Management System (HWDMS). This information was verified by using commercial hazardous waste directories.[25] Due to the particularly grievous hazards that landfills historically have posed to the environment, operating commercial hazardous waste landfills were isolated for special attention. In particular, we wanted to test the hypothesis that there may be a significant relationship between the size of a commercial hazardous waste landfill and the racial characteristics of the population living in contiguous communities. Landfill capacities were measured in terms of acre-feet (volume of water needed to fill one acre to a depth of one foot, or 43,560 cubic feet).

The methodological approach used in this study was a comparison of characteristics of small geographic areas which be may be relevant to the location of commercial facilities. The study compared five major variables in all areas of the nation: "minority percentage of the population", "mean household income", "mean value of owner-occupied homes", "number of uncontrolled toxic waste sites per 1,000 persons" and "pounds of hazardous waste generated per person".

Minority percentage of the population was used to measure racial composition of communities. Mean household income and mean value of owner-occupied homes were included to determine whether socio-economic factors were more important than race in the location of commercial facilities. Home values could also be used as a substitute or "proxy" variable to appraise the role of land values.

The existence of uncontrolled waste sites was evaluated to see whether some underlying historic or geographic factors are associated with the location of commercial hazardous waste facilities in ways that are not accounted for by other variables in the analysis. These factors could include land use, zoning, and transportation access, or the physical characteristics of sites such as groundwater, soil permeability and topography. Although the scope of this study limited the possibility for evaluating the specific factors involved in the siting process, these additional considerations should be included in future case studies of individual facilities. The hazardous waste generation variable was used to determine if there is a relationship between the location of facilities and their proximity to sources of waste generation, i.e., potential customers.

All residential ZIP code areas were divided into four mutually exclusive groups. The first was established to differentiate communities without

commercial hazardous waste facilities from those with facilities. Communities with one facility were divided into the two groups: either communities with a landfill or communities with another type of treatment, storage and disposal facility. Landfills were separated because of the historical problems they posed. The fourth group was established based on an approximate measure of greater commercial hazardous waste activity, i.e., communities with more than one facility or one of the nation's five largest landfills. The groups were:

-- Group 1: 5-digit ZIP code areas without operating commercial hazardous waste treatment, storage and disposal facilities;
-- Group 2: 5-digit ZIP code areas with one operating commercial hazardous waste treatment, storage and disposal facility that is not a landfill;
-- Group 3: 5-digit ZIP code areas with one operating commercial hazardous waste landfill that is not one of the five largest;
-- Group 4: 5-digit ZIP code areas with one of the five largest commercial hazardous waste landfills or more than one treatment, storage and disposal facility.

The analysis used five different statistical tests in order to derive findings that are independent of any single analytic technique. The statistical tests used were: discriminant analysis, difference of means test, matched-pairs test and non-parametric versions of the difference of means and matched-pairs tests. The analysis tested the following major hypotheses: (1) The mean minority percentage of the population was a more significant discriminator than the other variables for differentiating communities with greater numbers of commercial hazardous waste facilities and the largest landfills. (2) The mean minority percentage of the population was significantly greater in communities with facilities than in those without. These hypotheses were tested by comparing all communities and by comparing communities with facilities to those without in the surrounding county. The tests were performed on national, regional (EPA regions) and state levels.

While this study tested definite hypotheses, it can be thought of as more "hypothesis-generating" in approach. This study was not designed to show cause and effect. Because the study was exploratory, findings were considered significant not only at the 99 percent confidence level (that is, findings with a probability of less than 1 in 100 to have occurred by chance), but also results significant at the 90 percent confidence level were considered (that is, those with a probability of 1 in 10 that they were chance occurrences). In short, this study was concerned that it not overlook a significant association rather than include a less significant one. The significance of any particular association can be determined with more detailed follow-up study.

The second study was descriptive in nature. Its primary purpose was to document the presence of uncontrolled toxic waste sites in racial and ethnic communities. It sought to (1) quantify the number of racial and ethnic persons who lived in residential areas where uncontrolled toxic waste sites were located; (2) identify the specific areas where the presence of such sites was extensive; and (3) make comparisons, where appropriate, between the extent to which uncontrolled sites were located among different racial populations.

This study also used population data from the 1980 U.S. Census (STF 3B). Data on uncontrolled toxic waste sites came from the EPA's Comprehensive Environmental Response, Compensation and Liability Act Information System (CERCLIS). The descriptive study was based on communities surrounding 18,164 uncontrolled toxic waste sites. These represent all sites in the United States that the EPA catalogued as of early 1985 which were located within residential ZIP code areas.

Information for approximately 36,000 residential 5-digit ZIP code areas was formatted for the nation, EPA regions, states and for selected metropolitan areas. Cities selected for investigation came from listings developed by the U.S. Census Bureau of cities with the largest Black and Hispanic populations.[26,27,28] Aggregate population and uncontrolled toxic waste site counts for these metropolitan areas were calculated through use of those 3-digit ZIP codes which define large metropolitan areas. In most cases, metropolitan areas included in this study were slightly larger than the corporate boundaries of a given city.

RESULTS

This section summarizes the major findings of both studies: the analysis of race and the location of commercial hazardous waste facilities and the descriptive study on the racial composition of communities with uncontrolled toxic waste sites. The first study found that the group of residential ZIP code areas with the highest number of commercial hazardous waste facilities also had the highest mean percentage of residents who belong to a racial and ethnic group. Conversely, those residential ZIP codes with no waste facilities had a lower proportion of racial and ethnic residents. Figure 1 shows the mean minority percentage of the population in communities among the four groups tested.

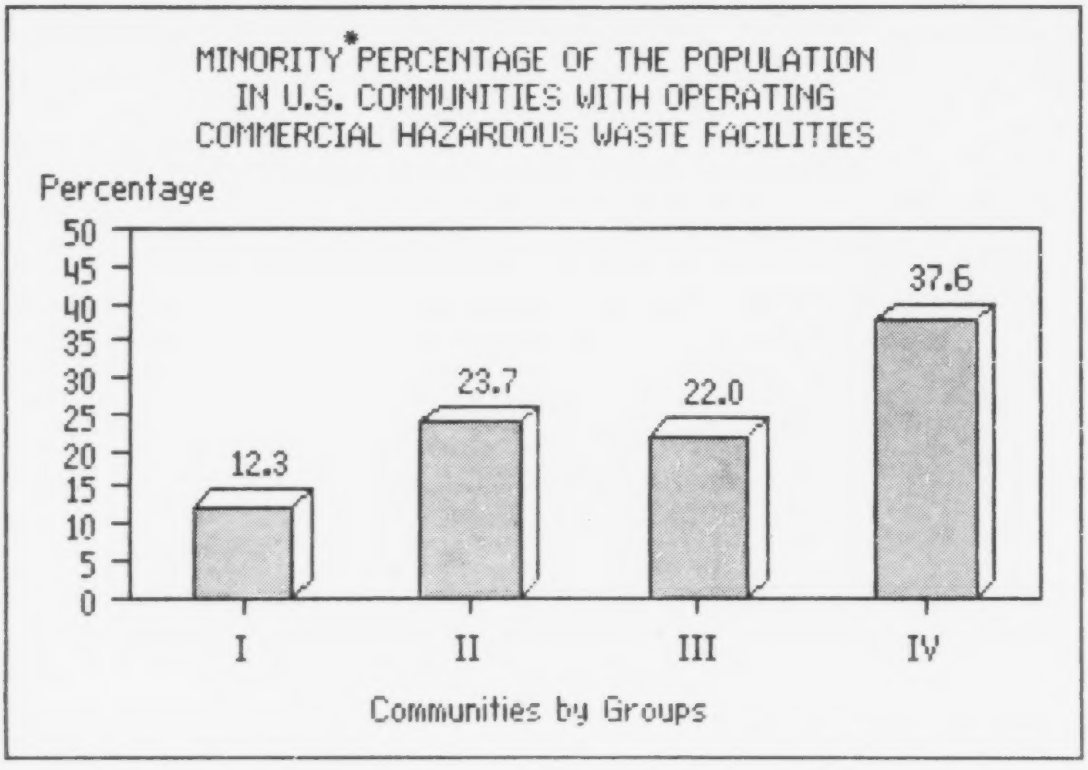
Specifically, in communities with one operating comme[illegible] hazardous waste facility, the mean minority percentage of the population was approximately twice that of communities without facilities (24 percent vs. 12 percent). In communities with two or more operating commercial hazardous waste facilities or one of the five largest landfills, the mean minority percentage of the population was more than three times that of communities without facilities (38 percent vs. 12 percent).

The analysis also revealed that mean household income and the mean value of owner-occupied homes were not as significant as the mean minority percentage of the population in differentiating residential ZIP codes with lesser numbers of hazardous waste facilities versus those with greater numbers and the largest landfills. After controlling for regional differences and urbanization, the mean value of owner-occupied homes in a community was a significant discriminator, but less so than the minority percentage of the population.

In summary, the results of the discriminant analysis tests revealed that the minority percentage of the population in relation to the presence of commercial hazardous waste facilities was statistically very significant. The percentage of community residents that belong to a racial and ethnic group was a stronger predictor of the level of commercial hazardous waste activity than was household income, the value of homes, the number of uncontrolled toxic waste sites or the estimated amount of hazardous wastes generated by industry.

The descriptive study, which focused on closed or uncontrolled toxic waste sites, found their presence in American communities to be highly pervasive. This study found that more than half of the population in the United States lived in residential ZIP code areas with one or more uncontrolled toxic waste sites. The study also found that three out of every five Black and Hispanic Americans lived in communities with uncontrolled toxic waste sites. This figure represents more than 15 million Blacks and 8 million Hispanics. Approximately 2 million Asian/Pacific Islanders and 700,000 American Indians lived in such communities.

FIGURE 1



GROUPS

I: Residential 5-digit ZIP code areas without operating commercial hazardous waste treatment, storage and disposal facilities.

II: Residential 5-digit ZIP code areas with one operating commercial hazardous waste treatment, storage and disposal facility that is not a landfill.

III: Residential 5-digit ZIP code areas with one operating commercial hazardous waste landfill that is not one of the five largest.

IV: Residential 5-digit ZIP code areas with one of the five largest commercial hazardous waste landfills or more than one treatment, storage and disposal facility.

SOURCE:

U.S. Census Bureau: 1980 Census of the Population

U.S. Environmental Protection Agency, Hazardous Waste Data Management System, 1986.

* Minority populations include: Blacks, Hispanics, Asian/ Pacific Islanders, American Indians and other "non-White" persons.

3. DISCUSSION OF FINDINGS

Numerous reports have been issued which document the social crisis occurring in Black and other racial and ethnic communities throughout the United States. The Children's Defense Fund, in a recent report on the plight of America's children, found that the infant mortality rate for Black children was twice that of their white counterparts.[29] In 1985, the U.S. Department of Health and Human Services issued its Report on Black and Minority Health, also known as the Heckler* Report, which chronicles the growing disparity in health status between "minority" and "non-minority" Americans.[30] Earlier this year, the National Urban League issued its annual State of Black America 1987 Report which further describes the crises confronting Black Americans, particularly with respect to employment and economic development.[31] Besides documenting the growing pattern of disparity in the quality of life between racial and ethnic Americans and their white counterparts, they point out a host of underlying factors related to race which contribute to this disparity. This report joins these others in documenting the existence of a population seriously "at risk."

The results of the study suggest that the disproportionate numbers of racial and ethnic persons residing in communities with commercial hazardous waste facilities is not a random occurrence, but rather a consistent pattern. Statistical associations between race and the location of these facilities were stronger than any other association tested. The probability that this association occurred purely by chance is less than 1 in 10,000.

It is significant that race was consistently a more prominent factor in the location of commercial hazardous waste facilities than any other factor examined. This was clearly the case with respect to socio-economic status. The most striking relationship between socio-economic status and the location of commercial hazardous waste facilities was revealed after the study controlled for regional differences and urbanization. Household incomes and home values were substantially lower when communities with

* Former Health and Human Services Secretary Margaret M. Heckler

hazardous waste facilities were compared to communities in the surrounding county without such facilities. Mean household income was $2,745 less and the mean value of owner-occupied homes was $17,301 less.

The minority percentage of the population remained the most significant factor for differentiating these two groups of communities. The only other variable which remained significant in the analysis was mean value of owner-occupied homes. These findings are suggestive of some important implications. The study focused on the location of commercial facilities because they are more likely to be influenced by factors such as land values and degree of local opposition. The lower value of homes indicates the availability of cheaper land. Combined with institutionalized forms of racial discrimination which target "less desirable" residential areas for Blacks and other racial and ethnic persons, these findings may shed light on some of the dynamics behind the location of hazardous waste facilities.

Finally, the 1983 GAO study and the data assembled for the Commission for Racial Justice show a propensity for locating large commercial landfills in predominantly rural Black communities: the largest commercial hazardous waste landfill in the nation is located in Emelle, Alabama (Sumter County) where Blacks comprise 78.9 percent of the population. Scotlandville, Louisiana is in the same category. Blacks make up 93.0 percent of the population in this host community for the nation's fourth largest landfill. Similarly affected are the Hispanic residents of Kettleman City, California who comprise 78.4 percent of the population and where the country's fifth largest landfill is located. These three communities account for approximately 40 percent of the total estimated landfill capacity in the United States.*

Both studies found a substantially larger number of racial and ethnic persons living in communities with some form of hazardous waste activity. For example, the average number of racial and ethnic persons who live in communities with commercial hazardous waste facilities was five times greater than in communities without such facilities (6,707 vs. 1,240). The same holds true for racial and ethnic populations in areas with uncontrolled toxic waste sites, where the average population is four times greater (3,244 vs. 723). While areas with waste sites tended to be more densely populated, the difference with respect to racial and ethnic populations is more pronounced.

* The percentage of the estimated total national commercial hazardous waste landfill capacity in these communities were: Emelle, AL - 23 percent (30,000 acre-ft.); Scotlandville, LA - 11 percent (14,400 acre-ft.); and Kettleman City, CA - 5 percent (6.670 acre-ft.). Descriptive statistics on communities with commercial hazardous waste landfills can be found in Table B-10.

It is clear from these studies that as the number of a community's racial and ethnic residents increases, the probability that some form of hazardous waste activity will occur also increases. The implications of that conclusion are serious. The Heckler Report has detailed the excess deaths of Blacks and other racial and ethnic persons in this country[32]; the presence of hazardous waste sites only serves to compound this problem. Since many facilities and uncontrolled sites tend to be located in those urban areas where large numbers of racial and ethnic Americans reside, the potential risk caused by transportation spills, explosions, toxic emissions, and groundwater contamination strikes hardest at racial and ethnic Americans who have been documented to be the most "at risk" when it comes to health and well-being.

This concentration of commercial hazardous waste facilities and uncontrolled toxic waste sites in populated areas is well illustrated by the 41 communities where the highest level of commercial hazardous waste activity is taking place. These are the residential ZIP code areas with more than one operating facility or one of the nation's five largest landfills. Thirty-three such communities have populations exceeding 10,000. These communities have an inordinately high number of uncontrolled toxic waste sites (378). Sixteen of these communities have 10 or more uncontrolled sites located within their boundaries. (Descriptive statistics on these 41 communities can be found in Table B-8.)

Another example of the concentration of hazardous wastes in highly populated areas is evidenced by the following five county areas: Los Angeles County in California; Cook County in Illinois; Wayne County, Michigan; the three northern New Jersey counties of Essex, Hudson and Union; and Cuyahoga County in Ohio. Major cities located in these areas are Los Angeles, California; Chicago, Illinois; Detroit, Michigan; Newark, New Jersey and Cleveland, Ohio (Table 1).

Table 1
Commercial Hazardous Waste Facilities And Uncontrolled Toxic Waste Sites In Five Selected County Areas

State/ County	Minority Percentage Of Population		Operating Commercial Hazardous Waste Facilities		Uncontrolled Toxic Waste Sites	
	State	County	State	County (%)	State	County (%)
CA/LOS ANGELES	33.0	46.7	41	14 (34%)	916	235 (25%)
IL/COOK	21.8	37.5	25	8 (32%)	846	212 (25%)
MI/WAYNE	15.7	38.1	21	14 (67%)	894	88 (10%)
NJ/ESSEX, HUDSON, UNION	20.7	39.0	22	9 (41%)	910	210 (23%)
OH/CUYAHOGA	11.7	25.0	48	13 (27%)	794	110 (14%)

Thus, while it is widely accepted that hazardous waste facilities should be located in less densely populated areas, the opposite seems to be the case. This finding raises serious concerns that the risks these communities may have already suffered are now being and will continue to be compounded by operating hazardous waste facilities. These areas tended to have large numbers of uncontrolled sites, suggesting the existence of a historical tendency to place commercial facilities in such communities. However, the minority percentage of the population in these communities again proved to be a more significant variable for differentiating these communities from those without facilities.

Due to the large number of racial and ethnic persons, particularly Blacks, who reside in urban areas, the Commission for Racial Justice decided to document the presence of uncontrolled toxic waste sites among Black communities in metropolitan areas. The Black population is not only concentrated in urban areas but disproportionately so in urban areas with large numbers of uncontrolled toxic waste sites. For example, 60 percent of Black Americans live in the central cities of Metropolitan Statistical Areas (MSAs).[33] The study identified the 50 metropolitan areas with the greatest number of Blacks living in communities with uncontrolled toxic waste sites. Among these 50 metropolitan areas, an average 73.5 out of every 100 Blacks live in communities with uncontrolled toxic waste sites.

(A map depicting these 50 metropolitan areas can be found in Figure A-1; a table with complete statistics on these 50 metropolitan areas is located in Table B-3.)

In the 10 metropolitan areas with the greatest number of uncontrolled sites, Blacks constitute more than 20 percent of the population in seven of these areas (Table 2). In addition, there are 10 metropolitan areas where more than 90 percent of the Black population lived in areas with uncontrolled sites (Table 3). The most prominent of these metropolitan areas is Memphis, Tennessee. Memphis, where 99.8 percent of the Black population resides in areas with uncontrolled toxic waste sites, ranks as the metropolitan area with the greatest number of such sites in the nation.

TABLE 2
Black Populations In Ten Metropolitan Areas
With Greatest Number Of Uncontrolled Toxic Waste Sites
(ranked by number of sites)

Metropolitan Area	# Toxic Waste Sites	Black Percentage Of Population In Metropolitan Area
1. MEMPHIS, TN	173	43.3
2. ST. LOUIS, MO	160	27.5
3. HOUSTON, TX	152	23.6
4. CLEVELAND, OH	106	23.7
5. CHICAGO, IL	103	37.2
6. ATLANTA, GA	94	46.1
7. SEATTLE, WA	83	7.1
8. NEW YORK, NY	77	24.6
9. BUFFALO, NY	71	14.8
10. OKLAHOMA CITY, OK	71	12.0

Black Percentage Of Total Population In U.S.: 11.7%

Table 3
Ten Metropolitan Areas With Greatest Percentage
Of Blacks Living In Communities With
Uncontrolled Toxic Waste Sites
(ranked in order of greatest percentages)

Metropolitan Area	Percentage Of Population Which Lives In Waste Site Areas	
	Black	White
1. MEMPHIS, TN	99.8	99.6
2. CHATTANOOGA, TN	99.5	79.2
3. FT. LAUDERDALE, FL	97.0	45.7
4. CHARLOTTE, NC	95.5	72.9
5. FLINT, MI	95.3	44.0
6. SEATTLE, WA	95.2	74.4
7. RALEIGH, NC	94.9	74.6
8. WINSTON-SALEM, NC	92.9	65.1
9. GREENSBORO, NC	92.9	84.8
10. LOUISVILLE, KY	92.7	56.6

A comparable pattern can be found among the Hispanic population in the United States, where at least six metropolitan areas have more than 100,000 Hispanic persons living in communities with uncontrolled toxic waste sites (Table 4).

Table 4
Six Metropolitan Areas With More Than 100,000 Hispanics
Living In Communities With Uncontrolled Toxic Waste Sites
(ranked by number of persons)

Metropolitan Area	Hispanics Living In Toxic Waste Site Areas	# Toxic Waste Sites	Percentage Of Total Population Of Group Which Lives In Site Areas	
			Hispanic	White
1. LOS ANGELES, CA*	425,323	60	60.0	35.5
2. CHICAGO, IL	352,125	103	81.3	59.1
3. NEW YORK, NY	322,516	77	23.0	23.6
4. HOUSTON, TX	257,451	152	81.3	57.1
5. SAN ANTONIO, TX	248,515	36	55.1	46.2
6. ALBUQUERQUE, NM	107,648	36	75.0	51.6

* Covers geographic area within 900 3-digit ZIP code

These findings suggest that the presence of uncontrolled toxic waste sites in urban Black and Hispanic communities may represent a substantially greater threat to the quality of life in such communities than was previously suspected. The presence of uncontrolled toxic waste sites in urban Black and Hispanic communities should not be examined in a vacuum, as these communities already suffer serious economic, health and environmental problems. In areas where such sites are particularly numerous, their role in contributing to the lower health status of racial and ethnic populations needs to be examined immediately.

Finally, the presence of uncontrolled toxic waste sites may represent a serious problem affecting all population groups: both in racial and ethnic communities and the nation as a whole. More than half of the Asian/Pacific Islander population and 46 percent of American Indians live in areas with such sites. However, this figure may not be a real indicator of hazardous waste problems in American Indian communities which are also affected by radioactive wastes. Radioactive wastes are primarily regulated by the Nuclear Regulatory Commission and the Department of Energy. These problems are particularly acute in the Southwest, where uranium mill tailings – waste from the processing of uranium ore – is a major environmental and public health concern.[34] Overall, more than half of the total population in the United States lives in communities with uncontrolled toxic waste sites. These findings underscore their pervasive presence in U.S. communities.

4. CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations presented in this section of the report are based on a thorough analysis of data from both research studies: the analytical study on the relationship between race and the location of commercial hazardous waste facilities and the descriptive study on the racial composition of communities with uncontrolled toxic waste sites.

The findings of the analytical study suggest the existence of clear patterns which show that communities with greater minority percentages of the population are more likely to be the sites of commercial hazardous waste facilities. The possibility that these patterns resulted by chance is virtually impossible, strongly suggesting that some underlying factor or factors, which are related to race, played a role in the location of commercial hazardous waste facilities. Therefore, the Commission for Racial Justice concludes that, indeed, race has been a factor in the location of commercial hazardous waste facilities in the United States.

The findings of the descriptive study suggest an inordinate concentration of uncontrolled toxic waste sites in Black and Hispanic communities, particularly in urban areas. This situation reveals that the issue of race is an important factor in describing the problem of uncontrolled toxic waste sites. We, therefore, conclude that the cleanup of uncontrolled toxic waste sites in Black and Hispanic communities in the United States should be given the highest possible priority.

The magnitude of the problem of hazardous wastes in racial and ethnic communities demands that an aggressive action plan be implemented, combining the best efforts of environmental agencies, corporations, environmental organizations, legislators, churches, civil rights and community-based organizations. The Commission for Racial Justice is therefore recommending a series of actions that have the potential for making the broadest social and political impact with respect to existing and potential hazardous waste problems in racial and ethnic communities.

Immediate attention should be focused on areas where the existence of operating hazardous waste facilities and uncontrolled sites may pose a serious threat to public health and overall community development. Seven metropolitan areas have been identified for particular attention due to the high number of Blacks, Hispanics and other racial and ethnic persons residing in them. They are: (1) Memphis, Tennessee; (2) St. Louis,

Missouri; (3) Houston, Texas; (4) Cleveland, Ohio; (5) Chicago, Illinois; (6) Atlanta, Georgia; and (7) Los Angeles, California. Many of the recommendations of this report will focus on programs and actions to address hazardous waste problems in these and similar metropolitan areas.

The recommendations include those actions which can be undertaken by governmental agencies that have a legal responsibility for protecting the public from environmental hazards, actions which can be adopted by corporations that would incur legal liabilities for not acting in a responsible manner, and actions that can be initiated by communities to protect themselves. Specific recommendations are addressed to each level of government.

FEDERAL GOVERNMENT

1. The President of the United States is called upon to issue an executive order mandating that all executive branch agencies with responsibility for regulating hazardous wastes assess and consider the impact of their current policies and regulations on racial and ethnic communities, and take such considerations into account when establishing new policies and promulgating new regulations.

2. The Environmental Protection Agency (EPA) should immediately establish an Office of Hazardous Wastes and Racial and Ethnic Affairs to address problems posed by the large number of hazardous waste sites found in racial and ethnic communities. This office should monitor the siting of new hazardous waste facilities to insure that adequate consideration is given to the racial and socio-economic characteristics of potential host communities. It should also monitor the cleanup of uncontrolled sites to insure that the needs of racial and ethnic communities are adequately addressed.

3. The EPA should also establish a National Advisory Council on Racial and Ethnic Concerns to be comprised of representatives from Black American, Hispanic American, Asian American, Pacific Islander and American Indian communities. The purpose of this advisory council will be to provide ongoing advice to the EPA on crucial environmental issues such as hazardous waste and to facilitate the dissemination of information on these issues to racial and ethnic communities throughout the nation.

4. The Administrator of the Agency for Toxic Substances and Disease Registry should perform health assessments for a representative number of sites in racial and ethnic communities under the Superfund Amendments and Reauthorization Act of 1986, irrespective of their inclusion on the National Priorities List.

5. The Environmental Protection Agency should sponsor a national conference to provide information to racial and ethnic groups on its

current projects and programs to protect communities from hazardous waste exposure.

6. The Department of Health and Human Services should conduct epidemiological studies to determine if hazardous wastes and other environmental pollutants are contributory factors in the development of known health problems in racial and ethnic communities.

7. The Congress of the United States is requested to enact legislation requiring the submission to it of a joint report, prepared by the Departments of Health and Human Services, Department of Transportation, the Agency for Toxic Substances and Disease Registry and the Environmental Protection Agency, on the efforts of these agencies to protect communities from the effects of hazardous wastes.

8. The Congress of the United States should commence hearings to:
   a. determine the full impact of hazardous wastes on the health and well-being of racial and ethnic communities;
   b. ascertain if existing environmental policies make racial and ethnic communities potentially more desirable areas for siting of hazardous waste facilities; and
   c. assess the role of the EPA in granting equal protection under such laws.

STATE GOVERNMENTS

1. All state governments should review their environmental policies to ascertain if racial and ethnic communities are being adequately protected from the dangers posed by hazardous wastes.

2. All state governments should evaluate their siting criteria to ascertain if existing criteria play a role in making racial and ethnic communities potentially more likely candidates for the siting of hazardous waste facilities. Appropriate revisions should be made to adequately take into account the racial and socio-economic characteristics of potential host communities.

3. All state governments should investigate the extent to which the existence of hazardous waste facilities has served as a detriment to the economic development of racial and ethnic communities.

4. State health agencies should initiate epidemiological studies which target racial and ethnic communities with large numbers of operating hazardous waste facilities and uncontrolled sites.

MUNICIPALITIES*

1. Municipal governments should establish and fund special task forces comprised of representatives of racial and ethnic communities to address the many problems resulting from the presence of hazardous waste sites in their communities.

2. Municipal governments, in conjunction with community-based organizations, should lobby the Environmental Protection Agency to revise criteria utilized to designate hazardous waste sites on the EPA's National Priorities List to ensure that sites in racial and ethnic communities are adequately included for priority cleanup.

3. Municipal governments should enact legislation which would protect densely populated and otherwise high risk residential areas from the siting of hazardous waste facilities.

4. The U.S. Conference of Mayors, the National Conference of Black Mayors and the National League of Cities should convene a national conference, in 1988, to address this national problem from a municipal perspective.

CHURCHES AND COMMUNITY ORGANIZATIONS

1. Local congregations, community organizations and residents should thoroughly investigate existing hazardous waste sites in their communities, and actively seek advice on potential problems posed by, and other matters related to, hazardous wastes from environmental agencies, organizations and experts.

2. Education programs regarding hazardous wastes and environmental pollution in racial and ethnic communities should be initiated and expanded. For example, churches should sponsor teach-ins in racial and ethnic communities to inform citizens of what they can do to organize around hazardous waste issues in their communities.

3. Increased voter registration should be encouraged as a method to further empower racial and ethnic communities to effectively respond to hazardous waste and environmental concerns. Specifically, civil rights and political organizations should gear up voter registration campaigns and place the issue of hazardous wastes in racial and ethnic communities at the top of state and national legislative agendas.

* These recommendations are specifically, but not exclusively, addressed to the municipal governments of the following metropolitan areas: Memphis, TN; St. Louis, MO; Houston, TX; Cleveland, OH; Chicago, IL; Atlanta, GA; and Los Angeles, CA.

4. Racial and ethnic residents and organizations should initiate legal actions to insure that racial and ethnic concerns regarding hazardous wastes are raised before the courts and federal and state agencies.

5. Community organizations should initiate legal assistance programs to aid racial and ethnic communities and individuals who are seeking compensation for injuries thought to be caused by exposure to hazardous wastes and environmental pollutants.

OTHERS

1. Corporations which seek to operate off-site hazardous waste treatment, storage and disposal facilities should review their corporate policies, and amend them where necessary, to ensure that their siting policies do not reflect a bias for locating new facilities in racial and ethnic communities.

2. Researchers should initiate data gathering and demographic research to ascertain if this report's findings are indicative of patterns with respect to other environmental pollutants in racial and ethnic communities. Areas for such study include nuclear wastes, pesticides, asbestos and lead.

3. Universities should give assistance to racial and ethnic students to seek training in technical and professional fields related to environmental protection such as environmental engineering, medicine, law and related fields. A special scholarship program should be jointly established by several philanthropic organizations to assist in this process.

4. Universities should fully develop curricula in the area of "environmental sociology" that provide for the study of racial and socio-economic patterns associated with environmental pollution and related questions.

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APPENDIX

A

FIGURE A-1

FIFTY METROPOLITAN AREAS WITH GREATEST NUMBER OF BLACKS LIVING IN COMMUNITIES WITH UNCONTROLLED TOXIC WASTE SITES

WA: Seattle

CA: Oakland
Los Angeles

WI: Milwaukee
MO: Kansas City
St. Louis

IL: Chicago
East St. Louis
MI: Flint
Detroit

IN: Gary
Indianapolis
OH: Cincinnati
Toledo
Columbus
Cleveland

MA: Boston
NY: Buffalo
Rochester
New York
NJ: Newark
PA: Philadelphia
MD: Baltimore
VA: Richmond
KY: Louisville
TN: Memphis
Nashville
Chattanooga
NC: Greensboro
Raleigh
Winston-Salem
Charlotte
SC: Columbia
GA: Atlanta
Savannah

OK: Oklahoma City
TX: San Antonio
Dallas
Houston

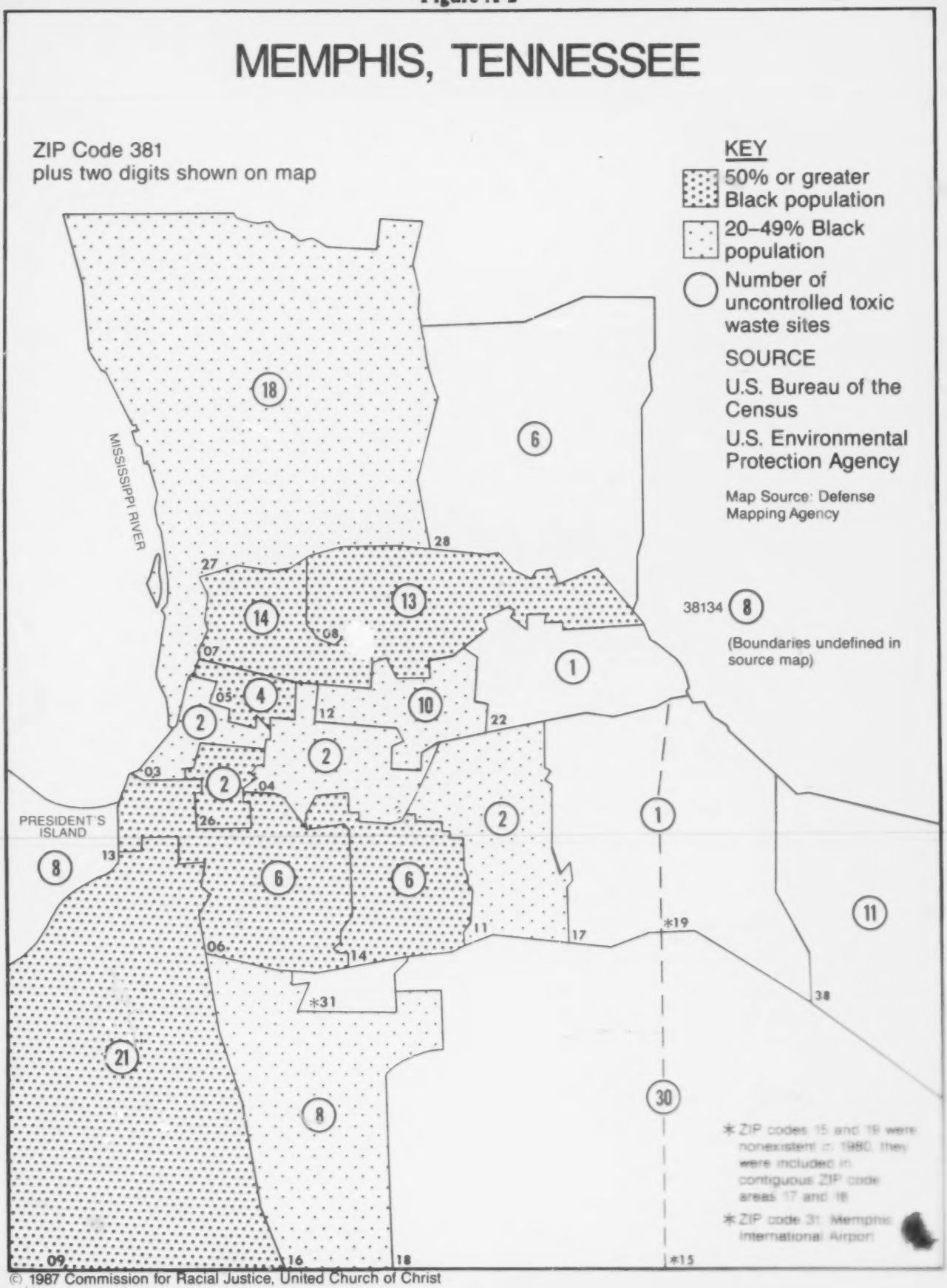
LA: Shreveport
Baton Rouge
New Orleans
MS: Jackson
AL: Birmingham
Montgomery
Mobile

FL: Jacksonville
Tampa
Fort Lauderdale
Miami

Source: U.S. Bureau of the Census
U.S. EPA Comprehensive Environmental Response, Compensation and Liability Act Information System

Note: Large numbers denote EPA Regions

Figure A-2


MEMPHIS, TENNESSEE
ZIP Code 381
plus two digits shown on map
KEY
50% or greater Black population
20–49% Black population
Number of uncontrolled toxic waste sites
SOURCE
U.S. Bureau of the Census
U.S. Environmental Protection Agency
Map Source: Defense Mapping Agency
38134 8
(Boundaries undefined in source map)
MISSISSIPPI RIVER
PRESIDENT'S ISLAND
* ZIP codes 15 and 19 were nonexistent in 1980; they were included in contiguous ZIP code areas 17 and 18.
* ZIP code 31: Memphis International Airport

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ST. LOUIS, MISSOURI

ZIP Code 631
plus two digits shown on map

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Figure A-3

Figure A-4

ATLANTA, GEORGIA

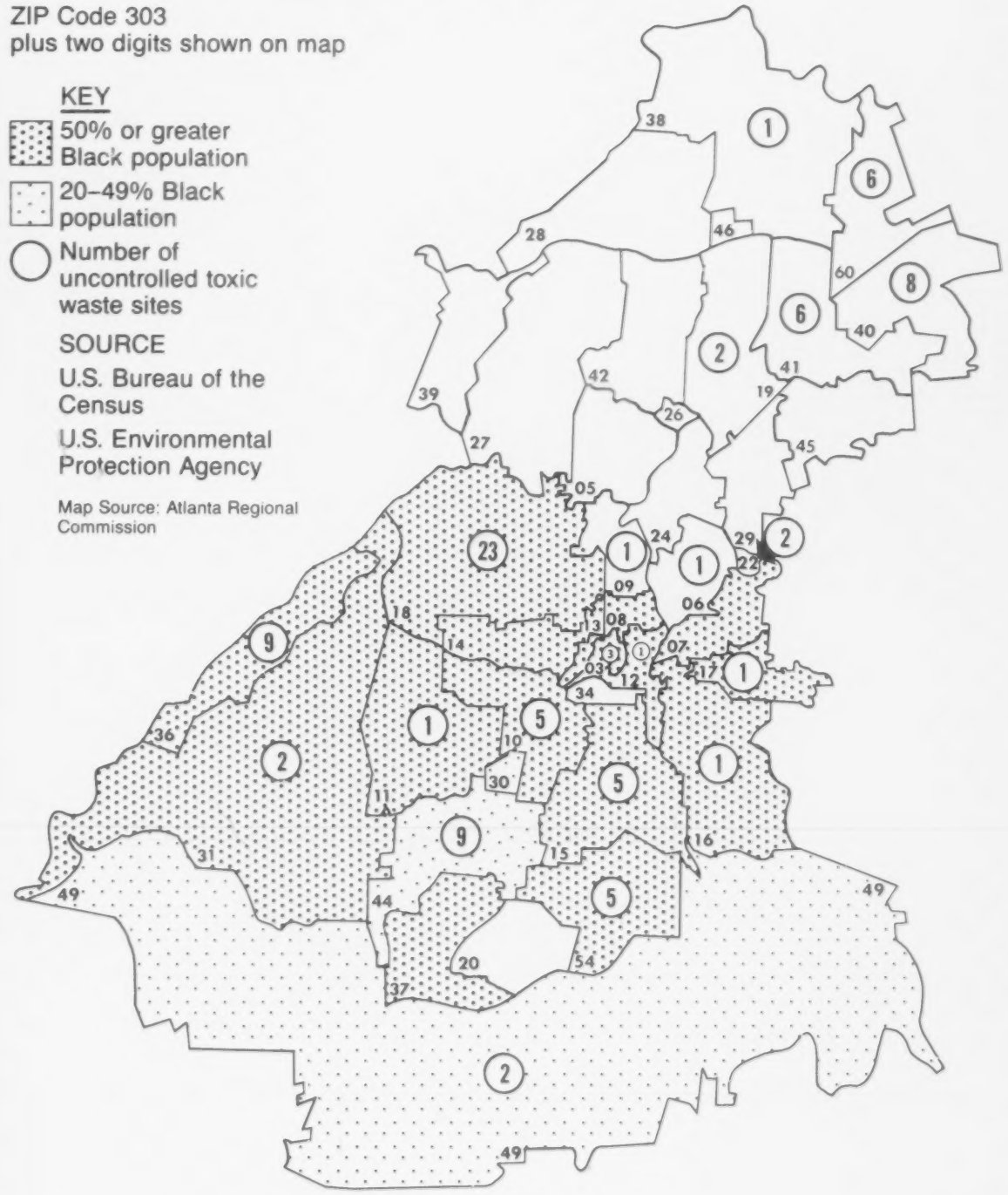

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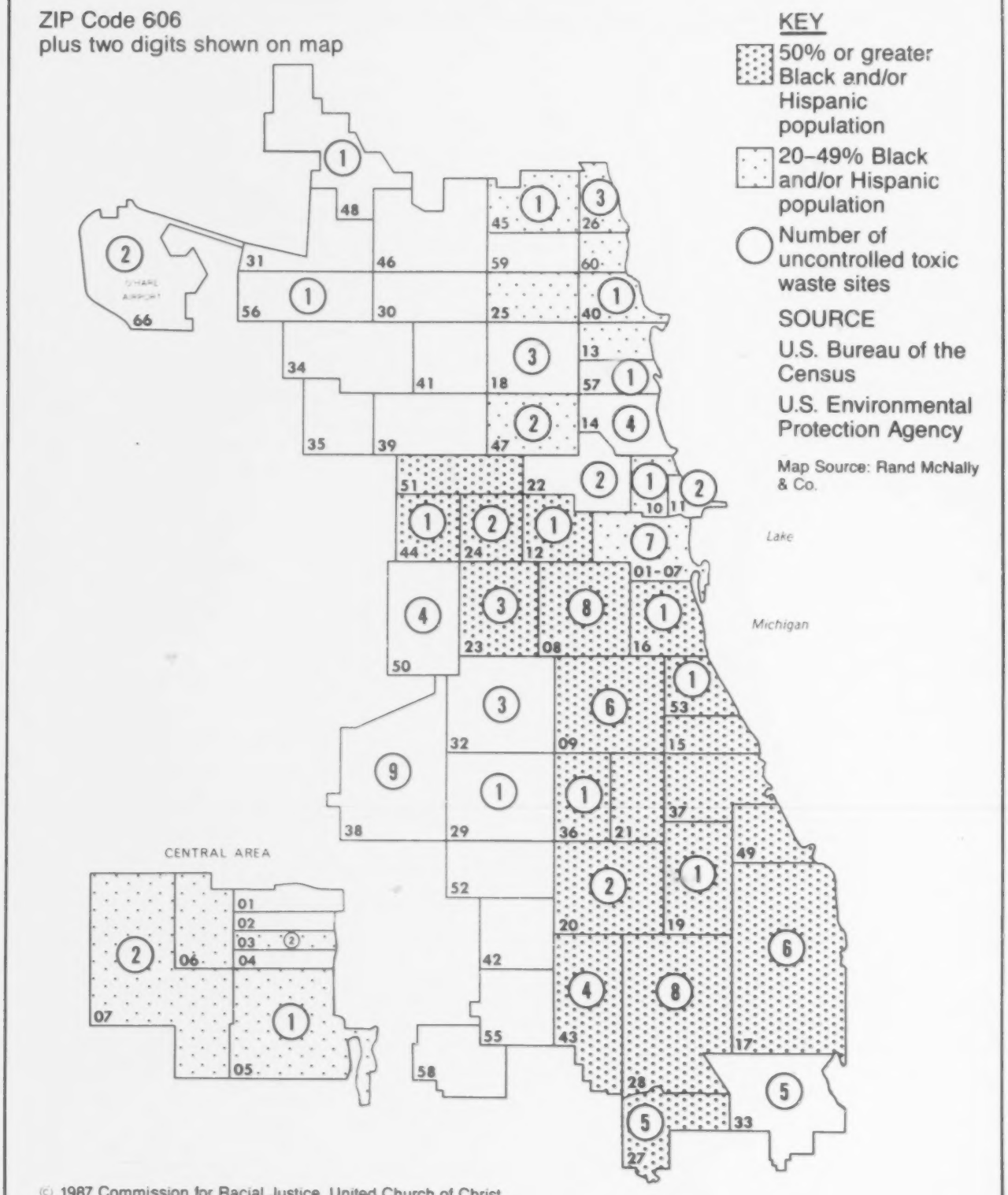
Figure A-5

CHICAGO, ILLINOIS



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LOS ANGELES, CALIFORNIA

ZIP Code 900
plus two digits shown on map

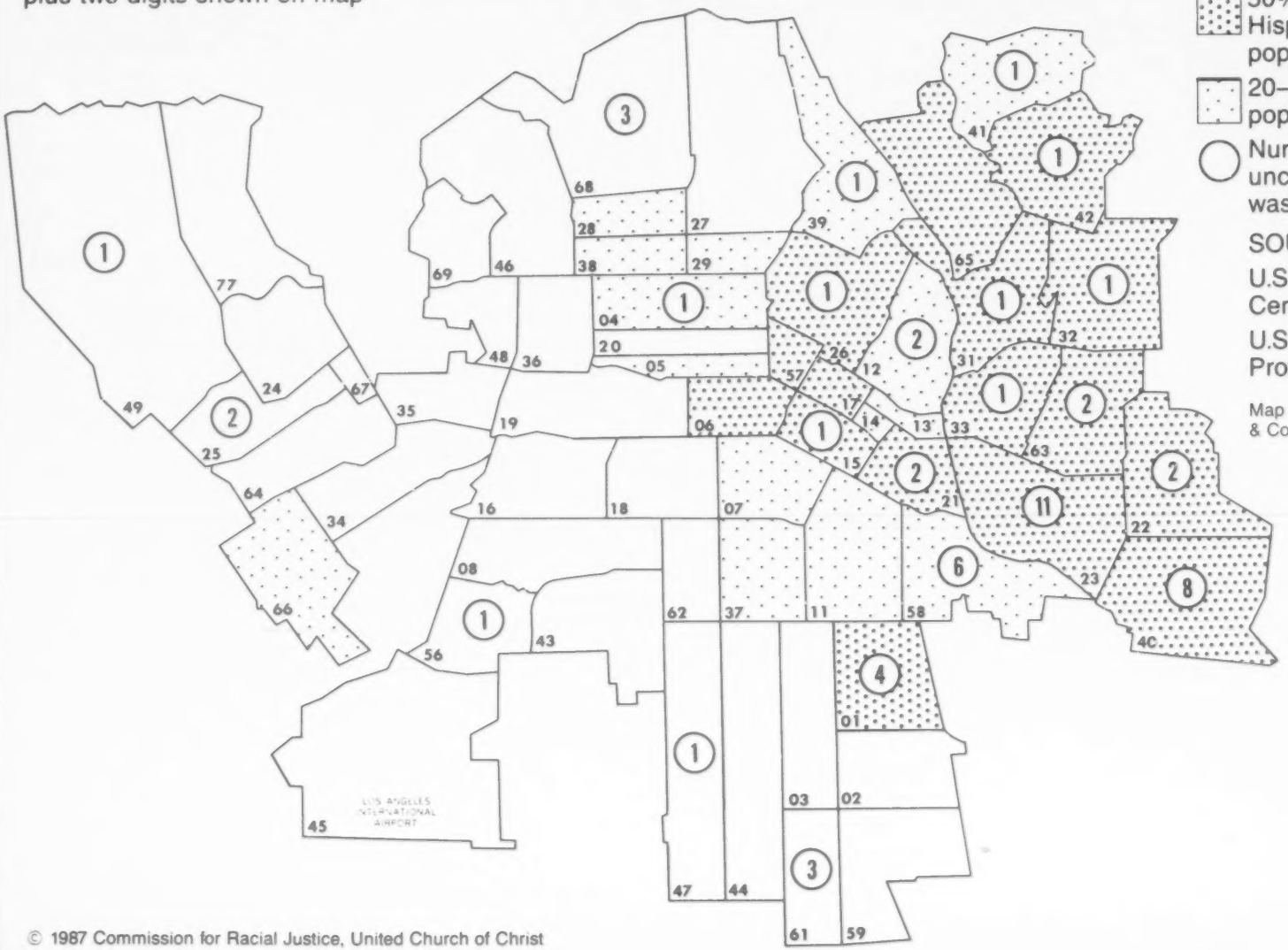

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Figure A-6

APPENDIX

B

TABLE B-1

OPERATING COMMERCIAL HAZARDOUS WASTE FACILITIES
SUMMARY OF NATIONAL STATISTICS

VARIABLE	DISCRIMINANT ANALYSIS SIGNIFICANCE	DIFFERENCE OF MEANS TEST MEAN IN 5-DIGIT ZIP AREA FOR: GROUP 1	GROUP 2	GROUP 3	GROUP 4	ZIP vs. COUNTY MATCHED-PAIRS TEST DIFFERENCE OF MEANS
Variables Listed in Order of Discriminant Analysis Significance						
Minority Percentage of the Population	**	12.3	23.7**	22.0	37.6**	5.0**
Mean Household Income	**	$23,718	$25,711**	$24,302	$23,749	-$2,745**
Uncontrolled Toxic Waste Sites per 1,000 Persons	**	0.269	0.980**	0.725**	0.432**	0.828*
Mean Value Owner-Occupied Home	NS	$71,812	$81,436**	$76,374	$75,891	-$17,301**
Pounds of Hazardous Waste Generated per Person	NS	3,379	8,001**	198**	7,022**	6,585*
Frequency of 5-Digit ZIP Code Areas and Facilities in Each Group						
Number of Residential ZIP Code Areas (Total = 35,406)		35,380	310	18	41	
Number of Operating Commercial Facilities (Total = 415)		0	310	18	87	

** Significant with greater than 99 percent confidence. For the difference of means test, this refers to the significance of the difference between the mean of a given Group and Group 1.

* Significant with greater than 90 percent confidence.

NS = Insignificant in the discriminant analysis, that is, less than 90 percent confidence.

GROUP 1 = 5-digit ZIP code areas without operating commercial hazardous waste treatment, storage and disposal facilities.

GROUP 2 = 5-digit ZIP code areas with one operating commercial hazardous waste treatment, storage and disposal facility that is not a landfill.

GROUP 3 = 5-digit ZIP code areas with one operating commercial hazardous waste landfill that is not one of the five largest.

GROUP 4 = 5-digit ZIP code areas with one of the five largest operating commercial hazardous waste landfills or with more than one treatment, storage and disposal facility.

TABLE B-2

RACIAL AND SOCIO-ECONOMIC VARIABLES ASSOCIATED WITH
THE LOCATION OF COMMERCIAL HAZARDOUS WASTE FACILITIES
IN THE UNITED STATES
(NATIONAL DISCRIMINANT ANALYSIS STATISTICS)

VARIABLE	COMPARISON OF ALL RESIDENTIAL ZIP CODE AREAS (Degrees of Freedom = 3, 35400)		COMPARISON OF RESIDENTIAL ZIP CODE AREAS WITH COMMERCIAL FACILITIES WITH THEIR SURROUNDING COUNTIES (Degrees of Freedom = 3, 6516)	
	F STATISTIC	PROB. > F	F STATISTIC	PROB. > F
Minority Percentage of the Population	51.393	0.0001	17.291	0.0001
Mean Household Income	12.265	0.0001	Insignificant	
Uncontrolled Toxic Waste Sites per Thousand Persons	3.966	0.0079	Insignificant	
Mean Value Owner-Occupied Home	Insignificant		11.314	0.0001
Pounds of Hazardous Waste Generated per Person	Insignificant		Insignificant	

TABLE B-3

OPERATING COMMERCIAL HAZARDOUS WASTE FACILITIES
SUMMARY OF REGIONAL STATISTICS

EPA REGION	NUMBER OF COMMERCIAL FACILITIES	DISCRIMINANT ANALYSIS SIGNIFICANCE OF MINORITY PERCENTAGE	DIFFERENCE OF MEANS TESTS --MEAN MINORITY PERCENTAGE IN GROUP 1	GROUP 2	GROUP 3	GROUP 4	ZIP VS. COUNTY MATCHED-PAIRS TESTS ----------DIFFERENCE IN:---------- MINORITY PERCENTAGE	MEAN INCOME	MEAN VALUE OWNER-OCCU. HOME	TOXIC SITES/TH. PERSONS	POUNDS OF WASTE/ PERSON
U.S.	415	**	12.3	23.7**	22.0	37.6**	5.0***	-2,745***	-17,301***	0.828***	6,585***
1	21	**	2.9	13.8***			4.7	-4,638**	-25,253**	0.022	369
2	41		9.4	16.9***	6.9	15.4	-1.5*	-2,239**	-13,697**	0.463**	4,182**
3	25	*	9.8	20.3**	0.7	23.1*	1.5	-3,740**	-21,941**	0.218	2,280
4	70	**	21.1	25.5*	71.6	49.3**	5.5*	-1,922***	-7,071*	2.567**	23,340**
5	122	**	4.3	19.0***	14.3	36.7***	3.9***	-2,302***	-13,867***	0.123***	2,006***
6	38		25.6	32.3*	29.8	35.5	1.6	-1,905**	-16,379***	0.163***	7,597**
7	25	**	2.8	21.4**		0.8	7.4	-2,677*	-14,905**	0.387**	721
8	11	**	8.5	29.0***	6.2	6.0	15.8*	-5,876	-26,876	0.558*	2,111*
9	46	**	25.6	47.7**	29.3	48.6*	13.9***	-4,228**	-41,986***	0.504***	1,307***
10	13		7.0	16.4**	8.4	6.6	4.0	-2,262	-7,608	5.339	13,819*

** Significant with greater than 99 percent confidence. For the difference of means test, this refers to the significance of the difference between the mean of a given Group and Group 1.

* Significant with greater than 90 percent confidence.

** Significant with greater than 99 percent confidence using the non-parametric tests (non-parametric tests were not applied to the difference of means for U.S. totals).

* Significant with greater than 90 percent confidence using the non-parametric tests (non-parametric tests were not applied to the difference of means for U.S. totals).

GROUP 1 = 5-digit ZIP code areas without operating commercial hazardous waste treatment, storage and disposal facilities.

GROUP 2 = 5-digit ZIP code areas with one operating commercial hazardous waste treatment, storage and disposal facility that is not a landfill.

GROUP 3 = 5-digit ZIP code areas with one operating commercial hazardous waste landfill that is not one of the five largest.

GROUP 4 = 5-digit ZIP code areas with one of the five largest operating commercial hazardous waste landfills or with more than one treatment, storage and disposal facility.

Blank spaces indicate insignificance or absence of ZIP code areas with facility in group.

TABLE B-4

RACIAL AND SOCIO-ECONOMIC VARIABLES ASSOCIATED WITH
THE LOCATION OF COMMERCIAL HAZARDOUS WASTE FACILITIES
U.S. ENVIRONMENTAL PROTECTION AGENCY REGIONS
(REGIONAL DISCRIMINANT ANALYSIS STATISTICS)

EPA REGION	DEGREES OF FREEDOM	MINORITY PERCENTAGE F STATISTIC	MINORITY PERCENTAGE PROB. > F	MEAN HOUSEHOLD INCOME F STATISTIC	MEAN HOUSEHOLD INCOME PROB. > F	MEAN HOME VALUE F STATISTIC	MEAN HOME VALUE PROB. > F	TOXIC SITES/ TH. PERSONS F STATISTIC	TOXIC SITES/ TH. PERSONS PROB. > F	POUNDS OF WASTE/ PERSON F STATISTIC	POUNDS OF WASTE/ PERSON PROB. > F
U.S.	3, 35402	51.393	0.0001	12.265	0.0001			3.966	0.0079		
1	1, 2043	39.238	0.0001								
2	3, 2575	1.880	0.1289								
3	3, 4764	2.707	0.0429								
4	3, 5943	4.886	0.0023	2.684	0.0443			3.292	0.0196		
5	3, 6427	75.002	0.0001	7.334	0.0001						
6	3, 4343			2.843	0.0358						
7	2, 3564	54.430	0.0001								
8	3, 2257	6.382	0.0003							2.008	0.1091
9	3, 2155	9.122	0.0001								
10	3, 1293							2.569	0.0520	15.382	0.0001

Blank spaces indicate insignificance

TABLE B-5

OPERATING COMMERCIAL HAZARDOUS WASTE FACILITIES
REGIONAL DISCRIMINANT ANALYSIS STATISTICS FOR COUNTIES WITH FACILITIES
U.S. ENVIRONMENTAL PROTECTION AGENCY REGIONS

EPA REGION	DEGREES OF FREEDOM	MINORITY PERCENTAGE F STATISTIC	MINORITY PERCENTAGE PROB. > F	MEAN HOUSEHOLD INCOME F STATISTIC	MEAN HOUSEHOLD INCOME PROB. > F	MEAN HOME VALUE F STATISTIC	MEAN HOME VALUE PROB. > F	TOXIC SITES/ TH. PERSONS F STATISTIC	TOXIC SITES/ TH. PERSONS PROB. > F	POUNDS OF WASTE/ PERSON F STATISTIC	POUNDS OF WASTE/ PERSON PROB. > F
U.S.	3, 6516	17.291	0.0001			11.314	0.0001				
1	1, 538	6.496	0.0111			3.276	0.0708				
2	3, 910										
3	3, 744	1.913	0.1242								
4	3, 878	2.765	0.0403								
5	3, 1285	9.114	0.0001			1.775	0.1481				
6	3, 599										
7	2, 312	3.111	0.0460								
8	3, 112	2.240	0.0861					21.694	0.0001		
9	3, 918	6.851	0.0002								
10	3, 187							3.321	0.0208		

Blank spaces indicate insignificance

TABLE B-6

OPERATING COMMERCIAL HAZARDOUS WASTE FACILITIES

SUMMARY STATISTICS BY STATE@

(only states with commercial facilities are listed)

EPA REGION	STATE	NUMBER OF COMMERCIAL FACILITIES	DISCRIMINANT ANALYSIS SIGNIFICANCE OF MINORITY PERCENTAGE	DIFFERENCE OF MEANS TESTS --MEAN MINORITY PERCENTAGE IN GROUP 1	GROUP 2	GROUP 3	GROUP 4	ZIP VS. COUNTY MATCHED-PAIRS TESTS DIFFERENCE IN: MINORITY PERCENT	MEAN INCOME	MEAN VALUE OWNER-OCCU. HOME	TOXIC SITES/TH. PERSONS	POUNDS OF WASTE/ PERSON
1	CT	10	**	6.0	17.6**±			4.8	-6,638	-33,567*	0.067	555±
1	MA	6	*	4.5	12.9*±			4.4	-5,453	-31,528*	0.000	-251
1	ME	2		1.1	2.1±			0.8	1,959	14,858	-0.088	-375
1	NH	1		1.0	3.0			1.4	831	-1,483	0.033	409
1	RI	2	*	3.5	15.1*			10.7	-1,524	-16,852	-0.033	2,017
2	NJ	22		12.3	18.9*		22.2	-1.2±	-3,067	-18,847*	0.642	3,760±
2	NY	19		8.5	14.8±	6.9	2.0	-1.8	-1,454	-8,817*	0.294*	4,582
3	DC	1		53.2	20.1			-54.2	-1,361	-43,127	-0.005	72
3	DE	2		16.3			26.4	11.0	2,691	19,844	-0.144	644
3	MD	6		17.4	13.6		19.8	-7.6	-6,400	-32,725	0.855	14,776
3	PA	12	**	3.3	13.5***±	0.7		5.4	-2,935	-15,541*	0.179*	213
3	VA	5		22.5	39.2±			6.6	-5,840*	-34,949*	0.048	512
4	AL	5		28.2	43.7		79.5	13.0	-3,478	-9,567	0.077*	-456
4	FL	8		19.2	22.8			-2.4	-799	1,636	0.230*	4,148
4	GA	13		26.7	19.9			-1.6	-351	-273	11.771	102,965±
4	KY	8	**	3.3	4.3		95.2±	11.3	-509	-5,371	0.653*	15,278
4	MS	2		41.3	44.3		59.1	8.6	-6,153	-30,476	-0.018	-402
4	NC	13		23.9	32.4*		22.8	10.8	-1,891	-8,650	0.126**	99
4	SC	9		37.6	27.6*	71.6	42.3	4.2	-1,142	-2,765	0.145*	1,040
4	TN	12	**	10.4	28.9***±		23.0	7.8	-4,999**	-20,812**	0.174	757
5	IL	25	**	5.2	24.1****±	7.9	34.7****±	2.0	-1,209	-17,028*	0.089*	3,764**±
5	IN	14	**	3.3	22.7****±	34.3±	1.5	4.3	-2,232*	-9,869	0.170*	2,389±
5	MI	21	**	5.5	43.1****±		41.3***±	20.0**±	-4,118**	-18,074****±	0.060**±	187
5	MN	6		2.5	5.8**±			0.4	-574	4,283	0.037	-14
5	OH	48	**	5.4	8.5**±	0.7	39.8****±	-1.7	-3,035*	-16,530**	0.185***±	2,360***±
5	WI	8	**	2.7	12.1****±			3.9±	484	-3,295	0.050	34
6	AR	2		15.4	30.9			-8.6*	3,774**	21,417*	0.211	83
6	LA	9		29.5	37.0	6.8	59.2*	7.2	-2,099	-14,605±	0.065	4,570
6	OK	7		13.7	11.3	4.3	14.3	-5.3	-4,593*	-27,386**	0.196	-318
6	TX	21	*	26.8	35.1	78.2	22.3	2.1	-1,691	-18,423*	0.194**	12,234±
7	IA	1	**	1.1	48.0±			42.4	-12,574	-47,067	-0.083	-380
7	KS	6	**	3.5	21.6***±			10.5	-545	-9,463	0.417	530
7	MO	13	**	4.7	20.3****±		0.8	1.3	-2,082	-14,760*	0.369	300
7	NE	5	**	2.6	18.0***±			11.3	-4,687	-15,352	0.488*	2,179
8	CO	7	**	14.0	27.3±		66.0	12.9	-5,086*	-22,772	0.563*	2,714*
8	ND	1	**	3.3	1.5			1.1	9,503	40,864	0.109	1,037
8	UT	3	*	9.4	47.3±	6.2		26.3	-12,582	-57,665	0.697	1,264
9	AZ	4		32.5	50.9			27.9	-5,570*	-25,390	-0.010	-373
9	CA	41	**	24.7	47.1**±	34.3	48.6**±	12.9****±	-4,006**	-44,060**	0.503**±	1,551****±
9	NV	1		17.3		4.7		-6.4	-6,611	-35,762	2.613	-519
10	ID	1		5.9		11.2		-5.4	953	-7,009	-0.261	475
10	OR	5		5.4	11.3±	5.7		1.4	-1,514	2,630	0.684*	1,846
10	WA	7		8.7	20.4*		6.6	7.8	-3,421	-16,240	10.151	26,020

@ Same key as Table B-3.

TABLE B-7

RACIAL AND SOCIO-ECONOMIC VARIABLES ASSOCIATED WITH
THE LOCATION OF COMMERCIAL HAZARDOUS WASTE FACILITIES
DISCRIMINANT ANALYSIS STATISTICS BY STATE
(only states with commercial facilities are listed)

EPA REGION		DEGREES OF FREEDOM	MINORITY PERCENTAGE		MEAN HOUSEHOLD INCOME		MEAN HOME VALUE		TOXIC SITES/ TH. PERSONS		POUNDS OF WASTE/ PERSON	
			F STATISTIC	PROB. > F	F STATISTIC	PROB. > F	F STATISTIC	PROB. > F	F STATISTIC	PROB. > F	F STATISTIC	PROB. > F
1	CT	1, 311	7.696	0.0059								
1	MA	1, 571	3.937	0.0477								
1	ME	1, 509					4.963	0.0263				
1	NH	1, 258	2.299	0.1307								
1	RI	1, 86	5.257	0.0243								
2	NJ	2, 616					2.937	0.0538				
2	NY	3, 1957										
3	DC	1, 27										
3	DE	1, 69										
3	MD	2, 515									92.313	0.0001
3	PA	2, 2031	5.847	0.0029								
3	VA	1, 1061					3.193	0.0743				
4	AL	2, 820	2.091	0.1244								
4	FL	1, 789										
4	GA	1, 770							60.351	0.0001		
4	KY	2, 1163	64.692	0.0001							21.766	0.0001
4	MS	2, 501					2.045	0.1305				
4	NC	2, 886										
4	SC	3, 448										
4	TN	2, 651	5.446	0.0045								
5	IL	3, 1398	15.194	0.0001	2.282	0.0761						
5	IN	3, 861	14.120	0.0001								
5	MI	2, 1010	69.805	0.0001								
5	MN	1, 961					22.378	0.0001				
5	OH	3, 1332	14.399	0.0001								
5	WI	1, 849	8.820	0.0031			6.264	0.0125				
6	AR	1, 696										
6	LA	3, 586										
6	OK	3, 727										
6	TX	3, 1938	2.487	0.0579	2.104	0.0962						
7	IA	1, 1028	322.966	0.0001			3.318	0.0688				
7	KS	2, 791	29.854	0.0001					2.445	0.1183	6.755	0.0095
7	MO	1, 1118	11.309	0.0001								
7	NE	1, 617	14.661	0.0001					5.371	0.0208		
8	CO	2, 502	4.784	0.0087							3.626	0.0273
8	ND	1, 470					2.080	0.1499			20.415	0.0001
8	UT	2, 265	3.796	0.0237					2.131	0.1207		
9	AZ	1, 343										
9	CA	3, 1689	9.947	0.0001								
9	NV	1, 121										
10	ID	1, 286										
10	OR	2, 422							2.301	0.1015	10.029	0.0001
10	WA	2, 582							23.495	0.0001		

Blank spaces indicate insignificance

TABLE B-8

DESCRIPTIVE STATISTICS OF FORTY-ONE COMMUNITIES
WITH ONE OF THE FIVE LARGEST LANDFILLS OR WITH MORE THAN ONE COMMERCIAL FACILITY

STATE	ZIP	POST OFFICE	COUNTY	TOTAL POPULATION	PERCENTAGE OF POPULATION IN ZIP CODE AREA			MEAN HOUSEHOLD INCOME	MEAN VALUE OWNER-OCCUPIED HOME	COMMERCIAL FACILITIES	TOXIC SITES
					MINORITY	BLACK	HISPANIC				
AL	35459	EMELLE*	SUMTER	1,221	79.5	78.9	0.0	$15,886	$40,886	1	0
CA	90670	SANTA FE SPRINGS	LOS ANGELES	13,627	63.2	0.2	60.2	$28,418	$118,468	2	19
CA	90744	WILMINGTON	LOS ANGELES	39,309	76.8	3.6	66.2	$23,934	$118,940	2	16
CA	93239	KETTLEMAN CITY*	KINGS	1,419	79.8	0.8	78.4	$19,976	$59,770	1	2
CA	94553	MARTINEZ	CONTRA COSTA	34,817	14.3	1.7	8.7	$33,384	$165,813	3	14
CA	94560	NEWARK	ALAMEDA	32,126	33.6	3.5	20.6	$36,741	$158,610	2	6
CA	94565	PITTSBURG	CONTRA COSTA	43,945	42.6	18.0	17.4	$25,592	$112,186	2	9
CA	95050	SANTA CLARA	SANTA CLARA	36,614	30.1	1.9	17.9	$28,876	$170,034	2	9
CO	80216	STOCKYARDS	DENVER	9,450	66.0	7.9	56.1	$18,094	$69,895	2	15
DE	19901	DOVER	KENT	49,194	26.4	22.2	2.4	$25,713	$90,201	2	5
IL	60160	MELROSE PARK	COOK	21,065	16.4	0.3	14.5	$27,988	$118,134	2	3
IL	60409	CALUMET CITY*	COOK	39,668	10.6	6.0	3.8	$31,822	$87,385	1	5
IL	62201	EAST SAINT LOUIS	SAINT CLAIR	13,139	77.2	72.2	4.6	$15,094	$37,315	2	10
IN	46241	STA #25	MARION	43,469	1.5	0.4	0.8	$26,021	$59,505	2	4
KY	40211	H STATION	JEFFERSON	32,603	95.2	94.7	0.4	$17,383	$35,826	2	8
LA	70554	MANOU*	EVANGELINE	5,007	23.8	21.6	1.8	$18,102	$51,395	1	0
LA	70807	SCOTLANDVILLE*	EAST BATON ROUGE	26,515	94.7	93.0	1.5	$20,203	$64,446	2	6
MD	21226	BROOKLYN-CURTIS BAY	ANNE ARUNDEL	6,771	19.8	18.7	0.5	$19,858	$56,537	3	16
MI	48111	BELLEVILLE	WAYNE	32,947	8.5	6.7	1.0	$33,043	$94,572	3	3
MI	48211	MILWAUKEE JUNCTION	WAYNE	26,089	67.8	64.8	1.6	$15,766	$21,098	2	5
MI	48227	STRATHMOOR	WAYNE	74,797	87.0	85.8	0.6	$25,702	$41,524	2	1
MI	49080	PLAINWELL	ALLEGAN	11,842	2.1	0.5	0.6	$29,089	$78,726	2	6
MO	64776	OSCEOLA	SAINT CLAIR	3,146	0.8	0.1	0.5	$16,353	$51,355	2	0
NC	27407	HILLTOP	GUILFORD	25,654	12.4	10.4	0.8	$28,042	$86,607	2	4
NC	27703	WELLONS VILLAGE	DURHAM	21,016	33.3	32.2	0.7	$22,978	$59,873	2	4
NJ	07032	KEARNY	HUDSON	52,219	8.4	0.1	7.2	$28,207	$105,194	4	33
NJ	07105	IRONBOUND	ESSEX	42,073	35.9	5.0	29.9	$22,840	$55,103	2	34
NY	14150	TONAWANDA	ERIE	59,363	2.0	0.9	0.4	$29,282	$72,432	2	39
OH	43616	OREGON BR	LUCAS	16,984	4.8	1.8	2.3	$31,910	$98,229	5	5
OH	44109	PEARLBROOK	CUYAHOGA	50,709	7.8	0.6	6.1	$22,422	$61,712	2	7
OH	44113	TERMINAL TOWER	CUYAHOGA	23,472	33.9	14.8	17.5	$13,961	$31,157	2	13
OH	44115	MAIN OFFICE AREA 4	CUYAHOGA	7,882	79.9	76.6	2.0	$ 9,331	$18,499	2	3
OH	44146	BEDFORD	CUYAHOGA	34,253	16.6	15.0	0.9	$29,697	$96,531	2	11
OH	45225	STOCK YARDS	HAMILTON	16,510	66.2	64.1	1.2	$13,676	$39,883	2	1
OH	45232	SAINT BERNARD AREA 3	HAMILTON	10,294	69.5	68.5	1.0	$16,810	$59,020	2	3
OK	74107	WEST TULSA	TULSA	21,999	14.3	5.5	1.7	$22,204	$62,185	3	13
SC	29150	SUMTER	SUMTER	64,905	42.3	40.4	1.2	$21,133	$65,413	2	3
TN	38474	MOUNT PLEASANT	MAURY	6,988	23.0	22.1	0.9	$19,690	$48,423	2	10
TX	77536	DEER PARK	HARRIS	21,948	7.3	0.3	6.2	$39,803	$103,181	3	10
TX	77590	TEXAS CITY	GALVESTON	40,700	37.3	23.2	12.3	$30,137	$71,522	2	12
WA	98031	KENT	KING	80,875	6.6	1.1	2.1	$34,153	$136,730	2	11

* One of five largest landfills.

TABLE B-9

SELECTED COUNTY AREAS WITH LARGE NUMBERS
OF OPERATING COMMERCIAL HAZARDOUS WASTE FACILITIES

COUNTY/STATE ZIP CODE AREA WITH FACILITY	# ACTIVE COMMERCIAL FACILITIES	MINORITY PERCENTAGE OF POPULATION	# UNCONTROLLED WASTE SITES
CALIFORNIA	41	33.0	916
LOS ANGELES COUNTY	14	46.7	233
Areas with facilities:			
90023 Lugo	1	95.6	11
90063 Hazard	1	97.3	2
90248 Main Office Area 2	1	60.9	2
90301 Hillcrest	1	69.4	1
90602 Main Office Area 2	1	35.8	3
90660 Pico Rivera	1	79.0	1
90670 Santa Fe Springs	2	63.2	19
90744 Wilmington	2	76.8	16
90813 Main Office Area 2	1	69.1	2
91702 Azusa	1	45.3	8
91803 South Alhambra	1	58.9	1
ILLINOIS	25	21.8	846
COOK COUNTY	8	37.5	212
Areas with facilities:			
60160 Melrose Park	2	16.4	3
60409 Calumet City	1	10.6	5
60419 Dolton	1	6.6	1
60426 Harvey	1	72.9	2
60480 Willow Springs	1	6.1	2
60525 La Grange	1	5.2	8
60609 Stockyards	1	66.3	6
60617 South Chicago	1	72.3	6
60633 Hegewisch	1	7.6	5
NEW JERSEY	22	20.7	910
NORTHERN COUNTIES	9	39.0	207
ESSEX COUNTY	3	47.3	62
HUDSON COUNTY	4	39.9	92
UNION COUNTY	2	23.3	53
Areas with facilities:			
07105 Ironbound (Essex)	2	35.9	34
07114 South (Essex)	1	86.8	4
07032 Kearny (Hudson)	4	8.4	33
07036 Linden (Union)	1	20.2	18
07206 Elizabethport (Union)	1	69.2	2

(more)

TABLE B-9

SELECTED COUNTY AREAS WITH LARGE NUMBERS
OF OPERATING COMMERCIAL HAZARDOUS WASTE FACILITIES

(continued)

COUNTY/STATE ZIP CODE AREA WITH FACILITY	# ACTIVE COMMERCIAL FACILITIES	MINORITY PERCENTAGE OF POPULATION	# UNCONTROLLED WASTE SITES
MICHIGAN	21	15.7	894
WAYNE COUNTY	14	38.1	88
Areas with facilities:			
48111 Belleville	3	8.5	3
48211 North End Area 3	2	67.8	5
48141 Inkster	1	58.7	2
48174 Romulus	1	16.3	5
48192 Wyandotte	1	3.2	15
48202 Fisher Building	1	85.4	4
48204 Northwestern	1	96.9	0
48214 Jefferson	1	86.3	1
48217 River Rouge Area 2	1	87.5	0
48227 Strathmoor	2	87.0	1
OHIO	48	11.7	794
CUYAHOGA COUNTY	13	25.0	110
Areas with facilities:			
44109 Pearlbrook	2	7.8	7
44110 Collinwood	1	35.3	5
44113 Terminal Tower	2	33.9	13
44115 Main Office Area 4	2	79.9	3
44117 Euclid	1	13.5	2
44125 Garfield Heights	1	4.8	10
44127 Willow	1	8.3	2
44136 Strongsville Br	1	3.6	1
44146 Bedford	2	16.6	11

TABLE B-10
DESCRIPTIVE STATISTICS OF TWENTY-SEVEN COMMUNITIES
WITH COMMERCIAL HAZARDOUS WASTE LANDFILLS

STATE	ZIP	CITY OR TOWN	COUNTY	FACILITY NAME	CAPACITY RANK	CURRENT CAPACITY IN ACRE-FEET	YEAR BEGAN OPERATION	PERCENTAGE OF POPULATION IN ZIP CODE AREA			MEAN HOUSEHOLD INCOME	MEAN VALUE OWNER-OCCUPIED HOMES
								MINORITY	BLACK	HISPANIC		
AL	35459	Emelle	Sumter	Chemical Waste Management, Inc.	1	30,000	1977	79.5	78.9	0.0	$15,886	$40,886
IL	60409	Calumet City	Cook	Chemical Waste Management--CID	2	25,206	1972	10.6	6.0	3.8	$31,822	$87,385
LA	70554	Livingston	Evangeline	CECOS International, Inc.	3	22,400	1978	23.8	21.6	1.8	$18,102	$51,395
LA	70807	Scotlandville	East Baton Rouge	Rollins Environmental Services LA	4	14,400	1971	94.7	93.0	1.5	$20,203	$64,446
CA	93239	Kettleman City	Kings	Chemical Waste Management, Inc.	5	6,670	1979	79.8	0.8	78.4	$19,976	$59,770
LA	70663	Carlyss	Calcasieu	Chemical Waste Management, Inc.	6	5,656	1975	6.8	4.6	1.7	$30,685	$86,887
OH	43616	Oregon	Lucas	Fondessy Enterprises, Inc.	7	5,637	1954	4.8	1.8	2.3	$31,910	$98,229
ID	83624	Grand View	Owyhee	Envirosafe Services of Idaho, Inc.	8	3,670	1973	11.2	0.0	11	$18,041	$52,653
TX	78380	Robstown	Nueces	Texas Ecologists, Inc.	9	3,150	1973	78.2	1.6	76.6	$23,273	$53,922
MI	48111	Belleville	Wayne	Wayne Disposal, Inc. Site #2	10	3,000	1975	8.5	6.7	1.0	$33,043	$94,572
OH	45176	Williamsburg	Clermont	CECOS International, Inc.	11	2,293	1972	0.7	0.2	0.4	$25,805	$80,440
IL	61615	Peoria	Peoria	Peoria Disposal Company	12	1,360	1968	7.9	4.2	1.2	$38,972	$131,356
PA	15019	Bulger	Washington	Mill Services, Inc.	13	1,250	1958	0.7	0.0	0.7	$26,498	$66,296
NV	89003	Beatty	Nye	US Ecology, Inc. Chem Site	14	800	1970	4.7	0.0	0.0	$19,403	$54,087
UT	84107	Knolls	Tooele	US Pollution Control, Inc.	15	632	1980	6.2	0.3	3.5	$28,640	$112,826
OR	97812	Arlington	Gilliam	Chemical-Security Systems, Inc.	16	535	1976	5.7	0.0	5.3	$25,797	$75,934
CA	94510	Benicia	Solano	IT Corp. Panoche Facility	17	300	1968	16.7	4.8	6.5	$33,725	$167,112
SC	29125	Pinewood	Sumter	GSX Services of South Carolina	18	289	1977	71.6	70.5	1.1	$15,666	$44,023
IN	46806	Fort Wayne	Allen	Chemical Waste Management of Ind.	19	140	1976	34.3	30.5	3.0	$24,468	$48,149
CA	93429	Casmalia	Santa Barbara	Casmalia Disposal	20	131	1972	42.2	0.0	42.2	$30,285	$48,825
OK	73860	Waynoka	Woods	US Pollution Control, Inc.	21	118	1979	4.3	0.0	3.8	$18,741	$35,078
TX	77590	Texas City	Galveston	Gulf Coast Waste Disp. Authority	22	110	19??	37.3	23.2	12.3	$30,137	$71,522
TX	77536	Deer Park	Harris	Rollins Environmental Services TX	23	103	1971	7.3	0.3	6.2	$39,803	$103,181
NY	14109	Model City	Niagara	SCA Chemical Waste Services	24	75	1969	8.1	3.6	4.2	$18,991	$79,042
NY	14304	Niagara	Niagara	CECOS International, Inc.	25	64	1976	5.7	3.6	1.1	$26,640	$67,699
CA	92281	Westmorland	Imperial	IT Corp. Imperial Facility	na	na	1980	67.5	0.4	64.3	$21,736	$66,636
CA	94523	Martinez	Contra Costa	Acme Fill Corporation	na	na	1953	10.5	0.9	5.7	$34,367	$180,135

APPENDIX

C

TABLE C-1
POPULATIONS LIVING IN COMMUNITIES WITH
UNCONTROLLED TOXIC WASTE SITES

UNITED STATES

POPULATION GROUP*	TOTAL POPULATION IN GROUP	NUMBER OF PERSONS LIVING IN WASTE SITE AREAS	PERCENTAGE OF GROUP WHICH LIVES IN WASTE SITE AREAS
TOTAL	226,523,095	122,673,020	54.15
WHITE	180,583,156	96,799,916	53.60
BLACK	26,480,783	15,123,783	57.11
HISPANIC	14,602,814	8,269,760	56.63
ASIAN/PACIFIC IS.	3,726,240	1,968,419	52.83
AMERICAN INDIAN	1,478,195	685,432	46.37
MINORITY	45,939,939	25,873,104	56.32

Number of Uncontrolled Toxic Waste Sites: 18,164
Number of Residential ZIP Code Areas: 35,749
Number of Areas with Uncontrolled Sites: 7,975

* "Minority" population is not a summation of persons in racial and ethnic groups. Hispanic population is defined by U.S. Census Bureau as a classification of Spanish origin. Since Blacks, Asians and Pacific Islanders, and American Indians of Spanish origin were double counted in the Census, they have been removed. The "White" population includes all persons who do not fall within a racial and ethnic group.

TABLE C-2

TWENTY-FIVE STATES WITH GREATEST NUMBER OF BLACKS
LIVING IN COMMUNITIES WITH UNCONTROLLED TOXIC WASTE SITES
(ranked by number of persons)

STATE	BLACKS LIVING IN WASTE SITE AREAS	# SITES IN STATE	TOTAL POPULATION OF GROUP IN STATE (TH)			PERCENTAGE OF GROUP WHICH LIVES IN WASTE SITE AREA		
			BLK	WH	ALL	BLK	WH	ALL
1. ILLINOIS	1,268,184	846	1,674	8,934	11,424	75.7	57.6	61.4
2. TEXAS	1,211,537	1537	1,705	9,369	14,229	71.1	61.7	64.6
3. GEORGIA	972,028	542	1,464	3,915	5,463	66.4	59.7	61.6
4. NORTH CAROLINA	903,284	648	1,319	4,430	5,882	68.5	64.3	65.0
5. CALIFORNIA	808,719	916	1,817	15,845	23,660	44.5	43.9	46.2
6. NEW YORK	733,273	1099	2,406	13,211	17,558	30.5	45.5	41.5
7. FLORIDA	712,916	322	1,343	7,476	9,746	53.1	34.9	37.2
8. LOUISIANA	688,221	299	1,238	2,842	4,206	55.6	53.7	54.4
9. MICHIGAN	660,122	894	1,197	7,805	9,262	55.1	63.7	62.7
10. OHIO	646,740	794	1,077	9,536	10,797	60.1	56.8	57.2
11. TENNESSEE	637,199	582	725	3,815	4,591	87.9	62.2	66.4
12. PENNSYLVANIA	622,731	1016	1,045	10,588	11,863	59.6	59.9	59.9
13. ALABAMA	610,869	386	996	2,854	3,893	61.3	53.8	55.7
14. NEW JERSEY	532,596	910	925	5,840	7,365	57.6	63.2	62.6
15. SOUTH CAROLINA	518,899	223	948	2,132	3,122	54.7	56.6	56.1
16. MISSISSIPPI	517,303	266	887	1,604	2,520	58.3	55.6	56.7
17. VIRGINIA	486,524	293	1,009	4,185	5,346	48.2	40.2	41.5
18. MARYLAND	398,521	159	957	3,124	4,217	41.6	40.6	40.8
19. MISSOURI	373,722	600	513	4,313	4,916	72.8	58.3	60.0
20. INDIANA	338,909	613	414	4,957	5,490	81.8	62.4	64.0
21. ARKANSAS	224,288	239	373	1,879	2,286	60.1	56.4	57.1
22. KENTUCKY	179,073	296	259	3,359	3,660	69.1	44.4	46.2
23. OKLAHOMA	152,024	451	205	2,574	3,025	74.2	61.3	62.0
24. WISCONSIN	134,200	212	183	4,408	4,706	73.3	50.0	51.2
25. MASSACHUSETTS	103,846	502	221	5,306	5,737	47.0	62.4	61.6

TABLE C-3

FIFTY METROPOLITAN AREAS WITH GREATEST NUMBER OF BLACKS LIVING IN COMMUNITIES WITH UNCONTROLLED TOXIC WASTE SITES

(ranked by number of persons)

METROPOLITAN AREA	BLACKS LIVING IN WASTE SITE AREAS	# SITES IN AREA	TOTAL POPULATION IN METROPOLITAN AREA			PERCENTAGE OF GROUP WHICH LIVES IN WASTE SITE AREAS			BLACK PERCENTAGE OF POPULATION IN AREAS		
			BLK	WH (TH)	ALL	BLK	WH	ALL	WITH SITES	W/O SITES	ALL AREAS
1. CHICAGO, IL	913,430	103	1,200	1,519	3,228	76.1	59.1	68.3	41.4	28.1	37.2
2. PHILADELPHIA, PA	370,425	46	642	1,005	1,731	57.7	57.5	57.4	37.3	36.8	37.1
3. NEW YORK, NY	361,458	77	1,762	3,836	7,177	20.5	23.6	22.6	22.3	25.2	24.6
4. DETROIT, MI	326,175	34	802	627	1,470	40.7	47.5	44.2	50.2	58.0	54.5
5. HOUSTON, TX	317,398	152	455	1,109	1,927	69.8	57.1	64.1	25.7	19.9	23.6
6. MEMPHIS, TN	312,074	173	313	402	723	99.8	99.6	99.7	43.3	29.2	43.3
7. ATLANTA, GA	292,757	94	354	398	76,	82.8	60.2	70.6	54.0	27.0	46.1
8. BALTIMORE, MD	262,211	59	476	810	1,309	55.1	44.7	48.6	41.2	31.7	36.3
9. ST. LOUIS, MO	247,698	160	306	788	1,113	81.0	83.4	82.7	26.9	30.1	27.5
10. CLEVELAND, OH	214,122	106	339	1,055	1,430	63.1	59.7	60.9	24.6	22.4	23.7
11. DALLAS, TX	191,430	60	266	577	971	71.9	53.5	60.1	32.8	19.2	27.4
12. NEW ORLEANS, LA	163,802	13	312	263	601	52.5	47.9	50.7	53.7	50.1	51.9
13. LOS ANGELES, CA*	156,975	60	542	595	2,000	28.9	35.3	43.0	18.2	33.8	27.1
14. BIRMINGHAM, AL	133,934	41	169	303	476	79.1	54.1	62.9	44.7	20.1	35.5
15. MIAMI, FL	123,628	19	207	638	1,278	59.8	22.2	27.0	35.9	8.9	16.2
16. INDIANAPOLIS, IN	116,177	40	155	604	772	74.7	68.8	70.0	21.5	17.0	20.1
17. MILWAUKEE, WS	113,056	32	149	678	866	75.9	59.6	63.3	20.6	11.3	17.2
18. OAKLAND, CA	111,149	30	160	129	351	69.3	23.7	50.7	62.3	28.4	45.6
19. CINCINNATI, OH	108,090	62	166	688	865	65.3	67.6	67.1	18.6	20.2	19.2
20. NEWARK, NJ	104,687	51	217	167	455	48.3	83.8	66.6	34.6	73.7	47.6
21. LOUISVILLE, KY	101,362	56	109	566	684	92.7	56.6	62.4	23.8	3.1	16.0
22. CHARLOTTE, NC	98,713	56	103	250	360	95.5	72.9	79.4	34.5	6.3	28.7
23. GARY, IN	92,583	25	108	81	203	86.0	73.8	80.3	56.8	37.7	53.0
24. NASHVILLE, TN	91,823	35	102	277	385	89.8	64.3	71.1	33.5	9.3	26.6
25. JACKSON, MS	89,265	21	99	137	238	89.8	52.4	68.1	55.0	13.3	41.7

* Covers only geographic area within 900 3-digit ZIP code

(more)

TABLE C-3

FIFTY METROPOLITAN AREAS WITH GREATEST NUMBER OF BLACKS LIVING IN COMMUNITIES WITH UNCONTROLLED TOXIC WASTE SITES

(continued)

METROPOLITAN AREA	BLACKS LIVING IN WASTE SITE AREAS	# SITES IN AREA	TOTAL POPULATION IN METROPOLITAN AREA			PERCENTAGE OF GROUP WHICH LIVES IN WASTE SITE AREAS			BLACK PERCENTAGE OF POPULATION IN AREAS		
			BLK	WH (TH)	ALL	BLK	WH	ALL	WITH SITES	W/O SITES	ALL AREAS
26. BATON ROUGE, LA	89,149	18	106	207	322	84.0	53.5	63.6	43.5	14.5	32.9
27. SHREVEPORT, LA	84,163	20	96	181	282	87.3	61.9	70.6	42.2	14.8	34.1
28. RICHMOND, VA	81,481	26	140	301	449	58.1	67.4	64.5	28.2	36.9	31.3
29. COLUMBIA, SC	81,058	12	92	163	262	88.1	75.2	79.2	39.1	20.2	35.1
30. BUFFALO, NY	76,491	71	101	565	684	75.8	81.5	80.8	13.9	18.5	14.8
31. KANSAS CITY, MO	76,106	57	123	388	533	61.8	55.2	57.1	25.0	20.6	23.1
32. MOBILE, AL	70,954	27	104	176	285	68.0	59.6	62.7	39.8	31.4	36.7
33. FLINT, MI	69,052	6	72	183	264	95.3	44.0	58.5	44.7	3.1	27.4
34. BOSTON, MA	67,234	65	147	1,378	1,611	45.8	47.6	47.2	8.9	9.4	9.1
35. JACKSONVILLE, FL	66,978	40	140	417	574	47.8	60.0	56.8	20.6	29.5	24.4
36. FT. LAUDERDALE, FL	65,066	15	67	410	497	97.0	45.7	53.0	24.7	0.9	13.5
37. SAVANNAH, GA	59,037	33	77	113	194	76.5	36.0	52.0	58.4	19.5	39.8
38. EAST ST. LOUIS, IL	56,848	14	70	46	116	81.7	21.2	57.6	85.1	25.9	60.0
39. TAMPA, FL	55,763	24	75	325	459	74.1	50.5	53.3	22.8	9.1	16.4
40. MONTGOMERY, AL	55,218	18	73	111	187	75.6	53.6	62.2	47.6	25.3	39.2
41. CHATTANOOGA, TN	54,021	57	54	147	203	99.5	79.2	84.7	31.4	0.8	26.7
42. OKLAHOMA CITY, OK	53,761	71	63	431	527	85.3	67.3	70.2	14.5	5.9	12.0
43. WINSTON-SALEM, NC	53,583	23	58	130	190	92.9	65.1	73.5	38.4	8.1	30.4
44. ROCHESTER, NY	52,272	26	68	415	501	77.4	64.2	66.5	16.7	9.1	13.5
45. GREENSBORO, NC	51,643	36	56	146	205	92.9	84.8	87.1	28.9	14.9	27.1
46. TOLEDO, OH	50,560	33	63	334	412	80.9	84.3	84.0	14.6	18.1	15.2
47. SAN ANTONIO, TX	50,129	36	67	422	950	74.6	46.2	52.5	10.1	3.8	7.1
48. COLUMBUS, OH	48,187	25	128	567	704	37.6	41.6	40.7	16.8	19.2	18.2
49. SEATTLE, WA	46,819	83	49	575	694	95.2	74.4	76.8	8.8	1.5	7.1
50. RALEIGH, NC	45,449	18	48	152	204	94.9	74.6	79.4	28.1	5.8	23.5

TABLE C-4

METROPOLITAN AREAS AND STATES WHERE SIGNIFICANTLY GREATER PERCENTAGES OF THE BLACK POPULATION LIVE IN COMMUNITIES WITH UNCONTROLLED TOXIC WASTE SITES

(ranked by difference between Blacks and Whites)

METROPOLITAN AREAS & STATES	PERCENTAGE OF GROUP WHICH LIVES IN SITE AREAS		RATIO: COMPARISON OF BLACK PERCENTAGE TO WHITE PERCENTAGE	BLACK PERCENTAGE OF POPULATION IN AREAS		
	BLK	WH		WITH SITE	W/O SITE	ALL AREAS
1. EAST ST. LOUIS, IL	81.7	21.2	3.85X	85.1	25.9	60.0
2. OAKLAND, CA	69.3	23.7	2.92X	62.3	28.4	45.6
3. MIAMI, FL	59.8	22.2	2.69X	35.9	8.9	16.2
4. FLINT, MI	95.3	44.0	2.17X	44.7	3.1	27.4
5. SAVANNAH, GA	76.5	36.0	2.13X	58.4	19.5	39.8
6. FT. LAUDERDALE, FL	97.0	46.2	2.10X	24.7	0.9	13.5
7. JACKSON, MS	89.8	52.4	1.71X	55.0	13.3	41.7
8. LOUISVILLE, KY	92.7	56.6	1.64X	23.8	3.1	16.0
9. SAN ANTONIO, TX	74.6	46.2	1.61X	10.1	3.8	7.1
10. BATON ROUGE, LA	84.0	53.5	1.57X	45.9	17.7	35.7
11. TAMPA, FL	74.0	50.5	1.47X	22.8	9.1	16.4
12. BIRMINGHAM, AL	79.1	54.1	1.46X	44.7	20.1	35.5
13. WINSTON-SALEM, NC	92.9	65.1	1.43X	38.4	8.1	30.4
14. SHREVEPORT, LA	87.3	61.9	1.41X	42.2	14.8	34.1
15. MONTGOMERY, AL	75.6	53.6	1.41X	47.6	25.3	39.2
16. NASHVILLE, TN	89.8	64.3	1.40X	33.6	9.3	26.6
17. ATLANTA, GA	82.8	60.2	1.38X	54.0	27.0	46.1
18. DALLAS, TX	71.9	53.5	1.34X	32.8	19.2	27.4
19. CHARLOTTE, NC	95.5	72.9	1.31X	34.5	6.3	28.7
20. CHICAGO, IL	76.1	59.1	1.29X	41.4	28.1	37.2
1. KENTUCKY	69.1	44.4	1.56X	10.6	4.1	7.1
2. FLORIDA	53.1	34.9	1.52X	19.6	10.3	13.8
3. WISCONSIN	73.3	50.0	1.47X	5.6	2.1	3.9
4. TENNESSEE	87.9	62.2	1.41X	20.9	5.7	15.8
5. ILLINOIS	75.7	57.6	1.31X	18.1	9.2	14.7
6. INDIANA	81.8	62.4	1.31X	9.6	3.8	7.6
7. MISSOURI	72.8	58.3	1.25X	12.7	7.1	10.4
8. OKLAHOMA	74.2	61.3	1.21X	8.1	4.6	6.8
9. VIRGINIA	48.2	40.2	1.20X	21.9	16.7	18.9
10. TEXAS	71.1	61.7	1.15X	13.2	9.8	12.0

TABLE C-5
STATES WITH GREATEST NUMBER OF HISPANICS
LIVING IN COMMUNITIES WITH UNCONTROLLED TOXIC WASTE SITES
(ranked by number of persons)

STATE	HISPANICS LIVING IN WASTE SITE AREAS (TH)	# SITES IN STATE	TOTAL POPULATION IN STATE (TH)			PERCENTAGE OF GROUP WHICH LIVES IN WASTE SITE AREAS		
			HISP	WH	ALL	HISP	WH	ALL
1. CALIFORNIA	2,496	916	4,540	15,845	23,660	54.8	43.9	46.2
2. TEXAS	2,098	1537	1,705	9,369	14,229	70.3	61.7	64.6
3. ILLINOIS	498	846	635	8,934	11,424	78.5	57.6	61.4
4. NEW YORK	461	1099	1,661	13,211	17,558	27.8	45.5	41.5
5. NEW MEXICO	320	165	477	690	1,303	67.0	69.6	66.0
6. NEW JERSEY	317	910	494	5,840	7,365	64.2	63.2	62.6
7. ARIZONA	307	217	444	2,028	2,718	69.1	51.9	53.6
8. FLORIDA	283	322	858	7,476	9,746	33.0	34.9	37.2
9. COLORADO	193	222	341	2,394	2,890	56.4	49.4	50.3
10. MICHIGAN	113	894	158	7,805	9,262	71.6	63.7	62.7

TABLE C-6

TWENTY-FIVE METROPOLITAN AREAS WITH GREATEST NUMBER OF HISPANICS LIVING IN COMMUNITIES WITH UNCONTROLLED TOXIC WASTE SITES

(ranked by number of persons)

METROPOLITAN AREA	HISPANICS LIVING IN WASTE SITE AREAS	# SITES IN AREA	TOTAL POPULATION IN METROPOLITAN AREA			PERCENTAGE OF GROUP WHICH LIVES IN WASTE SITE AREAS			HISPANIC PERCENTAGE OF POPULATION IN AREAS		
			HISP	WH (TH)	ALL	HISP	WH	ALL	WITH SITES	W/O SITES	ALL AREAS
1. LOS ANGELES, CA*	425,323	60	709	595	2,000	60.0	35.3	43.0	49.4	24.9	35.5
2. CHICAGO, IL	352,125	103	433	1,519	3,228	81.3	59.1	68.3	16.0	7.9	13.4
3. NEW YORK, NY	322,516	77	1,401	3,836	7,177	23.0	23.6	22.6	19.9	19.4	19.5
4. HOUSTON, TX	257,451	152	317	1,109	1,927	81.3	57.1	64.1	20.8	8.6	16.4
5. SAN ANTONIO, TX	248,515	36	451	422	950	55.1	46.2	52.5	49.8	44.8	47.5
6. ALBUQUERQUE, NM	107,648	36	144	254	420	75.0	51.6	54.8	46.7	18.9	34.2
7. MIAMI, FL	78,023	19	427	638	1,278	18.3	22.2	27.0	22.6	37.3	33.4
8. DALLAS, TX	75,325	60	115	577	971	65.5	53.5	60.1	12.9	10.2	11.8
9. DENVER, CO	74,192	43	120	552	752	61.7	42.8	47.4	20.8	11.6	16.0
10. PHOENIX, AZ	66,931	41	117	594	767	57.3	38.4	41.5	21.1	11.1	15.2
11. NEWARK, NJ	56,538	51	68	167	455	82.5	83.8	66.6	18.7	7.9	15.1
12. AUSTIN, TX	41,189	16	70	288	318	60.0	32.8	39.1	25.9	11.6	17.2
13. LONG BEACH, CA	36,408	14	53	255	375	68.3	54.6	58.9	16.5	11.0	14.2
14. SAN FRANCISCO, CA	35,026	11	84	361	678	41.6	12.4	18.1	28.5	8.8	12.4
15. PHILADELPHIA, PA	34,736	46	65	1,005	1,731	53.8	57.5	57.4	3.5	4.0	3.7
16. SAN JOSE, CA	31,960	11	154	438	681	20.7	14.0	16.2	29.0	21.4	22.7
17. SACRAMENTO, CA	25,703	11	55	333	474	47.1	36.8	37.4	14.5	9.7	11.5
18. BOSTON, MA	25,005	65	54	1,378	1,611	46.3	47.6	47.2	3.3	3.4	3.4
19. MILWAUKEE, WS	24,021	32	28	678	866	85.2	59.6	63.3	4.4	1.3	3.3
20. TAMPA, FL	22,986	24	56	325	459	41.4	50.5	53.3	9.4	15.2	12.1
21. OAKLAND, CA	22,873	30	33	129	351	69.8	23.7	50.7	12.8	5.7	9.3
22. DETROIT, MI	20,633	34	32	627	1,470	64.8	47.5	44.2	3.2	1.4	2.2
23. CLEVELAND, OH	19,602	106	24	1,055	1,430	82.3	59.7	60.9	3.2	1.4	2.2
24. HARTFORD, CT	15,642	4	30	223	305	51.5	34.2	32.4	2.3	0.8	1.7
25. SEATTLE, WA	13,272	83	16	575	694	81.2	74.4	76.8	2.5	1.9	2.4

*Covers only geographic area within 900 3-digit ZIP code

TABLE C-7
STATES WITH GREATEST NUMBER OF ASIANS AND PACIFIC ISLANDERS
LIVING IN COMMUNITIES WITH UNCONTROLLED TOXIC WASTE SITES
(ranked by number of persons)

STATE	ASIANS/PI LIVING IN WASTE SITE AREAS (TH)	# SITES IN STATE	TOTAL POPULATION IN STATE (TH)			PERCENTAGE OF GROUP WHICH LIVES IN WASTE SITE AREAS		
			A/PI	WH	ALL	A/PI	WH	ALL
1. CALIFORNIA	606	916	1,313	15,845	23,660	46.2	43.9	46.2
2. HAWAII	412	71	591	311	965	69.8	61.6	67.2
3. ILLINOIS	102	846	172	8,934	11,424	59.0	57.6	61.4
4. WASHINGTON	88	461	112	3,734	4,132	78.7	69.1	69.2
5. NEW YORK	83	1099	331	13,211	17,558	25.2	45.5	41.5

TABLE C-8
STATES WITH GREATEST NUMBER OF AMERICAN INDIANS
LIVING IN COMMUNITIES WITH UNCONTROLLED TOXIC WASTE SITES
(ranked by number of persons)

STATE	INDIANS LIVING IN WASTE SITE AREAS (TH)	# SITES IN STATE	TOTAL POPULATION IN STATE (TH)			PERCENTAGE OF GROUP WHICH LIVES IN WASTE SITE AREAS		
			IND	WH	ALL	IND	WH	ALL
1. CALIFORNIA	109	916	227	15,845	23,660	48.1	43.9	46.2
2. OKLAHOMA	95	451	171	2,574	3,025	55.6	61.3	62.0
3. ARIZONA	45	217	154	2,028	2,718	28.9	51.9	53.6
4. NEW MEXICO	36	165	107	690	1,303	34.0	69.6	66.0
5. WASHINGTON	36	461	61	3,734	4,132	58.9	69.1	69.2

APPENDIX D
DATA EXPLANATIONS AND SOURCES

These studies used demographic and hazardous waste databases developed by Public Data Access, Inc. (PDA), New York, New York. A detailed explanation of data used in the studies, their respective sources and their limitations follow:

FIVE-DIGIT ZIP CODE AREAS:

Residential areas were defined as those 5-digit ZIP code areas in the U.S. Census Bureau's 5-digit ZIP code database (Summary Tape File 3B or STF 3B) which have:

(1) Total population of at least one person; and
(2) At least one person enumerated by race (including White) or by Spanish origin.

Of the total 36,763 5-digit ZIP code areas identified in STF 3B, 35,749 (97 percent) fit this definition. Of the excluded 1014 ZIP code areas, 258 had zero total populations and 756 had zero persons enumerated by race or Spanish origin.

The database used for these studies included all enumerated residential ZIP code areas identified by the 1980 census. Only the 35,406 residential 5-digit ZIP code areas in the contiguous United States were included in the analysis of commercial hazardous waste facilities, as information about commercial facilities in Hawaii and Alaska was unavailable. Residential ZIP code areas in these two states numbered 343.

These studies made innovative use of 5-digit ZIP code areas to analyze the association of hazardous wastes with minority populations. Businesses involved with targeted direct-mail marketing have long recognized the value of using ZIP codes as basic units for appraising demographic and socio-economic characteristics of potential customers. ZIP codes are uniquely suited for integrating databases that contain widely diverse fields of information, but have the common feature of containing complete addresses. The 5-digit ZIP code is currently the smallest geographic unit that can be used for consistent and comprehensive database integration purposes. Thus, the 5-digit ZIP code area was chosen to define a "community" in the studies.

Much ZIP code data with socio-economic measures have only been available recently. The most recent decennial census for the United States, compiled by the U.S. Bureau of the Census of the U.S. Department of Commerce for the year 1980, was the first census tabulated for every 5-digit ZIP code area in the U.S. The 1970 census contained 5-digit ZIP code areas for Standard Metropolitan Statistical Areas (SMSAs); for all other areas, only 3-digit ZIP code areas were tabulated.

The tabulation of 1980 5-digit ZIP code data was never published in printed form, however, due to restrictions pursuant to the Paperwork Reduction Act of 1980 (44 U.S.C., 3501-3520, 1982). This was enacted in order to reduce government spending. Budget cutbacks almost forced cancellation of the production of 5-digit ZIP code data. A consortium of firms which specialized in marketing, recognizing the potential value of such data for analytical purposes, paid the Census Bureau hundreds of thousands of dollars reimbursement to produce magnetic tapes of the ZIP code data. In return, this consortium received proprietary use of the data for 18 months. The Census Bureau did not make the machine-readable ZIP code data available to the public until the spring of 1983.

The 5-digit ZIP code area made it possible to identify communities and neighborhoods nationwide. While some neighborhoods, such as Harlem in New York City, comprise several ZIP code areas (10026, 10027, 10030, 10031, 10035, and 10037 in the case of Harlem), others may only constitute a part of a ZIP code area. While variations in geographic areas covered by a given ZIP code represent a limitation for their use in these analyses, the vast majority of residential 5-digit ZIP codes in urban areas cover relatively small geographic areas.

Moreover, the 5-digit ZIP code area remains the best available unit for defining communities in a national study that requires integration of numerous data sources. Census data was available for geographic units that are smaller than 5-digit ZIP code areas, including tracts, block groups, blocks and enumeration districts. These smaller units allow for more precise definitions of neighborhoods in some cases. Unfortunately, these smaller geographic units are relatively unique to Census Bureau data. Most other government and business databases do not use such geographic units.

Some 5-digit ZIP code areas included in the census file were identified as "Main Post Office Boxes" by the U.S. Postal Service. These ZIP codes nevertheless represent geographic areas that are not included in other ZIP code areas. Persons and hazardous waste sites associated with such ZIP code areas are located within the general vicinity of such post offices.

Because the database for these studies includes only enumerated residential ZIP code areas identified by the 1980 census, some of the ZIP code areas included in the other databases that were integrated with the Census file were excluded in this analysis. Since the total number of ZIP code areas and the actual physical boundaries of ZIP codes can change over time, different databases often have ZIP code universes that are marginally inconsistent. In a few cases, new ZIP code areas have been created since 1980.

RACIAL AND ETHNIC POPULATIONS:

All population data were taken directly from U.S. Census File STF 3B and relate to April, 1980 when the census was taken. All persons who received a census questionnaire were asked to identify themselves according to the following race categories: White, Black or Negro, American Indian, Eskimo, Aleut, Japanese, Chinese, Filipino, Korean, Asian Indian, Vietnamese, Hawaiian, Guamanian, Samoan, and "Other." The "Other" category includes Polynesian, Thai and other groups not included in the specific categories listed on the census questionnaire.

The number of persons classified as "Hispanic" include all who identified themselves as of Spanish origin or descent, that is, Mexican (60 percent), Puerto Rican (14 percent), Cuban (6 percent), or other Spanish (20 percent). If the person reported a multiple origin (i.e., parents of different origin), the origin of the person's mother was used. The Spanish-origin question was asked on a 100-percent basis for the first time in 1980. In 1970, a similar question was asked on a five percent sample questionnaire.

According to the U.S. Census, "Spanish Origin" is a completely different classification than "race." The latter divides the total population into White, Black, and the other categories listed above. Persons classifying themselves as of Spanish Origin also classify themselves as being either White, Black, or another race. For deriving a count of the total racial and ethnic population, one must avoid such double-counting. This necessitates the removal of persons of Spanish origin from the racial categories. "Minority" population as defined in this study comprised the summation of the following populations:

(1) Black population not of Spanish origin;
(2) Asian & Pacific Islander, American Indian, and Eskimo & Aleut populations not of Spanish origin;
(3) Other non-white populations not of Spanish Origin; and
(4) Hispanic population.

The Census does not provide separate estimates for non-Spanish Asians & Pacific Islanders, American Indians, and Eskimos & Aleuts. A count of these populations was provided only in aggregate. The Census Bureau's STF 3B ZIP code file was derived from an 18.2 percent sample enumeration, summaries of which were published in "Characteristics of the Population, Chapter C." The percent of persons in the sample range from a mean of 15.8 percent in urban areas to a mean of 24.9 percent in less populated rural areas. The following table shows the differences between selected population summaries from Chapter C publications and data in the STF 3B ZIP code file.

COMPARISON OF PUBLISHED CHAPTER C POPULATIONS COUNTS
WITH STF 3B COUNTS

VARIABLE	CHAPTER C COUNTS	STF 3B COUNTS	DIFFERENCE IN PERCENT
TOTAL POPULATION	226,545,805	226,523,095	0.010
WHITE POPULATION	189,035,012	182,854,577	3.269
MINORITY POPULATION	45,942,967	45,939,939	0.007
BLACK POPULATION	26,482,349	26,480,783	0.006
HISPANIC POPULATION	14,603,683	14,602,814	0.006
ASIAN/PACIFIC ISLANDER	3,726,440	3,726,240	0.005
AMERICAN INDIAN	1,478,523	1,478,195	0.022
MINORITY PERCENT OF TOTAL	20	20	0.000

In only one of the major population categories was the difference in aggregations more than three one-hundredths of one percent (0.03%). This error was in the enumeration of white persons not of Spanish origin where almost 6.2 million persons, or approximately 3.3 percent are missing. The Census Bureau is currently investigating this serious error, which apparently was not identified prior to this study. It should be noted that this error did not affect the accuracy of the minority population aggregates, or their percent of the total population, since these figures were independent of the white population counts and accurately correspond with the published counts. Furthermore, there is no evidence to indicate that more white persons were missing from ZIP code areas with uncontrolled sites or operating commercial facilities than from those without. The actual percentage of white persons in these areas was likely to be similar to the data in STF 3B.

SOCIO-ECONOMIC MEASURES:

Financial data collected for the 1980 census relate to the year 1979 and therefore do not reflect inflationary trends since that time. PDA's database had, previous to this study, adjusted mean income data to reflect inflationary increases of 35 percent during the five year period from 1979 to 1984. This increase was based on Bureau of Labor Statistics consumer price indices for rent and all consumer goods during the five year period (See U.S. Bureau of Census, Statistical Abstract of the United States, 1984).

In addition, PDA adjusted home values upward by 25 percent to help compensate for the estimated understatement of such values by respondents who were fearful that their answers would be used for tax assessment purposes. The 25 percent adjustment was based on discussions with realtors in Los Angeles and New York where understatement was reported to be even greater. (The Census Bureau would not offer an official estimate of the admitted degree of understatement.) The adjustments were made consistently

for every ZIP code and merely scale the dollar values to more easily understood and updated 1984 dollars.

The only other refinement PDA made to the socio-economic data was estimating values for ZIP code areas with fewer than 30 households. The Census suppresses data on owner-occupied units whenever fewer than 30 units are involved. It does not, however, withhold households data. Estimates for resulting missing figures were calculated on the basis of the national ratio between the mean home value to income per household.

OPERATING COMMERCIAL HAZARDOUS WASTE FACILITIES:

The U.S. Environmental Protection Agency (EPA) defines a commercial facility as a "facility (public or private) that accepts hazardous waste from a third party for a fee or other remuneration, for the specific purpose of treating, storing or disposing of that waste, except captive facilities." Captive facilities are defined as those facilities established by a specific company to accept only that firm's own waste products.

Data regarding commercial hazardous waste facilities were extracted directly from EPA's Hazardous Waste Data Management System (HWDMS), the most comprehensive database on hazardous waste that is available currently. PDA acquired a copy of this database in May 1986 under the Freedom of Information Act. As EPA states, "the universe of commercial facilities is not being reported at this time because of the difficulty of identifying these facilities in HWDMS." Information on the number of operating commercial facilities in each ZIP code was derived from published directories of commercial facilities, one of the the best being Environmental Information Ltd., Industrial and Hazardous Waste Management Firms (Minneapolis, MN: 1986). Four hundred fifteen (415) operating commercial treatment, storage and disposal (TSD) facilities were identified. Aggregate counts of all operating commercial facilities are provided for each ZIP code area in the contiguous United States.

Identification of operating commercial hazardous waste landfills and their current capacities required a complicated set of procedures. A preliminary listing was derived from:

(1) All facilities identified in Industrial and Hazardous Waste Management Firms as having onsite landfill capacity;
(2) All commercial facilities identified in HWDMS as having onsite landfill design capacity (the amount allowable under interim status) or permit capacity (the amount in the facility's Part B Permit application); and
(3) All commercial facilities identified by EPA in its January 1986 listing of land disposal sites that were required to certify compliance with the November 8, 1985 ground water monitoring and financial instruments regulations.

Telephone interviews were then conducted in August and September, 1986 with plant managers or other responsible personnel at all sites in the preliminary listing. This served to verify information obtained from the above sources and to derive current capacities.

A final listing of 27 operating commercial landfill facilities along with their current landfill capacities resulted from these interviews. Many of the facilities in the preliminary listing dropped out either because they operated a solid waste landfill, their landfill was closed, they provided other land disposal services (such as deep well injection) or they planned to operate a landfill in the future but were not operating a landfill currently. Current capacity amounts were unavailable for two operating landfills as indicated in the following table.

OPERATING COMMERCIAL HAZARDOUS WASTE LANDFILL
FACILITIES IN THE CONTIGUOUS UNITED STATES

RANK	FACILITY	ZIP	CITY/STATE	CAPACITY*
1.	Chemical Waste Management, Inc.	35459	Emelle/AL	30,000
2.	Chemical Waste Management--CID	60409	Calumet City/IL	25,206
3.	CECOS International, Inc.	70554	Livingston/LA	22,400
4.	Rollins Environmental Svces LA	70807	Scotlandville/LA	14,400
5.	Chemical Waste Management, Inc.	93239	Kettleman City/CA	6,670
6.	Chemical Waste Management, Inc.	70663	Carlyss/LA	5,656
7.	Fondessy Enterprises, Inc.	43616	Oregon/OH	5,637
8.	Envirosafe Svces of Idado, Inc.	83624	Grand View/ID	3,670
9.	Texas Ecologists, Inc.	78380	Robstown/TX	3,150
10.	Wayne Disposal, Inc. Site #2	48111	Belleville/MI	3,000
11.	CECOS International, Inc.	45176	Williamsburg/OH	2,293
12.	Peoria Disposal Company	61615	Peoria/IL	1,360
13.	Mill Services, Inc.	15019	Bulger/PA	1,250
14.	US Ecology, Inc. Chem Site	89003	Beatty/NV	800
15.	US Pollution Control, Inc.	84107	Knolls/UT	632
16.	Chemical-Security Systems, Inc.	97812	Arlington/OR	535
17.	IT Corp. Panoche Facility	94510	Benicia/CA	300
18.	GSX Services of South Carolina	29125	Pinewood/SC	289
19.	Chemical Waste Management/IN	46806	Fort Wayne/IN	140
20.	Casmalia Disposal	93429	Casmalia/CA	131
21.	US Pollution Control, Inc.	73860	Waynoka/OK	118
22.	Gulf Coast Waste Disp. Authority	77590	Texas City/TX	110
23.	Rollins Environmental Svces TX	77536	Deer Park/TX	103
24.	SCA Chemical Waste Services	14109	Model City/NY	75
25.	CECOS International, Inc.	14304	Niagra/NY	64
26.	IT Corp. Imperial Facility	92281	Westmoreland/CA	na
27.	Acme Fill Corporation	94523	Martinez/CA	na
	TOTAL CAPACITY			127,989

* Capacity measured in acre-feet na=Current capacity not available

The standard unit of measurement for landfill capacity is acre-feet. One acre-foot, which is defined as the volume of water that will cover an area of one acre to a depth of one foot, equals 43,560 cubic feet or 14,520 cubic yards. The data provided are for the facility's estimate of current landfill capacity. This amount may differ from that designed to be handled by the facility under interim status or the amount as applied for in Part B of its permit application.

UNCONTROLLED TOXIC WASTE SITES:

These are sites identified by the EPA under its Superfund program to contain hazardous wastes and may require cleanup in the future. The count of uncontrolled toxic waste sites in each ZIP code area is derived from EPA's Comprehensive Environmental Response, Compensation and Liability Act Information System (CERCLIS), which was obtained under the Freedom of Information Act during the spring of 1985. CERCLIS is updated on a continual basis. As of July, 1986 CERCLIS contained records on 24,756 sites, of which 19,972 (81 percent) are listed in the CERCLIS file used in this study.

The sites in the file include the closed treatment, storage, and disposal facilities that EPA has catalogued in its ongoing survey of sites that may require cleanup now or in the future. Superfund sites, or those identified by EPA as requiring priority cleanup, are among those identified in the file. Closed units of certain operating facilities are also included. EPA conducted preliminary assessments of approximately 50 percent of the sites at the time the data was acquired. Regional EPA offices also performed a screening of sites that were thought to be erroneously listed.

For these studies, all ZIP codes areas identified in EPA databases that had waste sites but that did not correspond to ZIP code areas in the Census Bureau's file were dropped from the database. Out of the 19,972 closed sites that were listed in EPA's CERCLIS file, 18,164 (91 percent) were located in the residential ZIP code areas identified in the Census file.

HAZARDOUS WASTE GENERATION ESTIMATES:

These estimates, which were developed by PDA and already existed in their database, were intended to provide an approximation of the level of industrial activity within 5-digit ZIP code areas. They were derived by using input-output analysis and weighted toward industries known to account for the bulk of hazardous waste generation. Due to their limitations as precise measures of hazardous waste generation, their use in these studies was limited. Estimates of the volume of hazardous waste generated in a community were included to determine whether proximity to potential industrial consumers of commercial waste management services was a factor which merited further investigation.

APPENDIX E
PUBLIC DATA ACCESS, INC.*

Public Data Access, Inc. (PDA) is an information company that specializes in computer formatted data of public interest. Its data files were obtained from such agencies as the U.S. Bureau of the Census and the U.S. Environmental Protection Agency. PDA currently has federal files that cover the following areas: the environment (with emphasis on hazardous and radioactive wastes), socio-economic data and vital health statistics.

The origins of PDA lay in the work of the Council on Economic Priorities (CEP). CEP is an independent and non-profit public service research organization based in New York City. CEP's activities focus on providing accurate and impartial analysis of issues including corporate responsibility, environmental impact and military spending.

The principal staff members of Public Data Access are Jay M. Gould, Ph.D.; Michael Tanzer, Ph.D.; and Benjamin A. Goldman.

Jay Gould founded Economic Information Systems, which developed a database on 150,000 industrial establishments in the United States. This became a widely used online database and is now owned by Control Data Corporation. From 1978 to 1980, Dr. Gould was a member of the U.S. Environmental Protection Agency's Science Advisory Board. Dr. Gould has a highly successful record in developing computer-generated publications. He is the author of numerous articles and books, among them: The Quality of Life in American Neighborhoods: Levels of Affluence, Toxic Waste, and Cancer Mortality in Residential ZIP Code Areas (Boulder, CO: West View Press, 1986); Input/Output Databases, Uses in Business and Government (New York & London: Garland STMP Press, 1979); The Technical Elite (New York: Augustus M. Kelley, 1968); and Productivity Trends in American Utilities (New York: National Bureau of Economic Research, 1946). Most recently, Dr. Gould has conducted research on the relationship of hazardous wastes and cancer mortality rates. He received his Ph.D. in economics from Columbia University in 1946.

Michael Tanzer is an expert on the technical and corporate structure of the U.S. economy, particularly the energy and mineral areas. He also has more than 15 years experience operating his own consulting firm. Dr. Tanzer has published many articles and books on oil, energy, natural resources, and political economy, including The Race for Resources: Continuing Struggles Over Minerals and Fuels (New York: Monthly Review Press, 1980) and The Political Economy of International Oil and the Underdeveloped Countries

* Public Data Access, Inc. is located at 30 Irving Place, New York, New York 10003 (212-529-0890).

(Boston: Beacon Press, 1969). Along with Stephen Zorn, Dr. Tanzer authored Energy Update: Oil in the Late Twentieth Century (New York: Monthly Review Press, 1985). He received his Ph.D. in economics from Harvard University in 1962.

Benjamin A. Goldman is an expert on the hazardous waste industry and has extensive experience in analyzing governmental databases. He developed a comprehensive environmental database dealing with the major commercial handlers of hazardous wastes in the U.S., which is available online through Chemical Information Systems, Inc. Mr. Goldman has authored numerous articles on hazardous wastes. Along with James Hulme and Cameron Johnson, he authored Hazardous Waste Management: Reducing the Risk (Washington, DC: Island Press, 1986).